

MAY 1940

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Coal Age

Anticipation being a thing that delights the human race, we point out now that June will be the Convention Report Number of Coal Age. If you didn't get to the American Mining Congress doings at Cincinnati, or if you made it and want to check up on your findings, June will give you the dope on both the technical sessions and the exhibits . . . Meantime, don't miss the good things in this issue for both executives and operating men, such as the new Millstadt carbonizing plant which converts Illinois No. 6 coal into smokeless fuel for St. Louis (p. 33); the new Jefferson No. 20 preparation plant where all coal can be reduced to 5/16 in. and dedusted at 10-mesh (p. 34); and the new Armco barge-loading plant using portable conveyors on a ramp on the river bank for handling coal (p. 37) . . . New developments in mechanical mining also characterize this issue, starting off with an account of how a new pit-operated pit-car loader is increasing production per man in thin coal in the Cranberry No. 1 mine in spite of heavy grades and bad roof (p. 29), and winding up with a de-

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Born as an instrument of research,- but grew up to be a substation



(Inset) The first installation of Westinghouse Ignitron Rectifiers. (Above) A recent installation in a Western Pennsylvania mine. Users find that high efficiency and overload capacity, greater dependability, and easy mobility of this modern conversion equipment cut power costs, reflect substantial reduction in cost per ton.

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HOW'S BUSINESS

(CONTINUED FROM PAGE 5)

scription of the reopening of Blocton No. 9, in Alabama, with conveyors underground and new washing equipment on the surface (p. 47) . . .

From anthracite comes a description of a simplified signal system which eases the engineer's work in hoisting from several levels. E. B. Wagner tells, among other things, how the principle of red and green traffic signals was applied to hoisting service (p. 40) . . . **Ventilation** rounds out the May subject list, with Raymond Mancha taking the stand to present new reasons for the use of propellor-type fans on shaft bottoms, using the old surface fans as standbys (p. 51) . . . **For the future**, Coal Age has in the mill a series of articles by N. P. Rhinehart on the development of the inspection practices of the West Virginia Department of Mines and how they promote safety; stripping and coal preparation at the new property of the Midwest-Radiant Corporation in St. Clair County, Illinois and the method used to install a 2,300-volt rubber-covered cable in a borehole at a mine of the Cannelton Coal & Coke Co., with J. F. Dangerfield as the author . . .

The Coal Age front cover this month, showing part of the mechanical-mining equipment at Blocton No. 9, was released for editorial use by the Hulbert Oil & Grease Co., whose advertisement occupied this spot last year.

GENERAL BUSINESS ACTIVITIES

The business recession has continued, but within narrow range, during the last four weeks. The immediate effect on this side of the Atlantic of the spread of Europe's war front was mixed. According to *Business Week*, despite the unbulish first response of the stock market, it is not illogical to conclude that the recession may be over and that a period of making a bottom—with minor ups and downs from week to week—has begun. The index had slid from 107.9 a month ago to 105.1 on April 6.

ELECTRICAL POWER OUTPUT

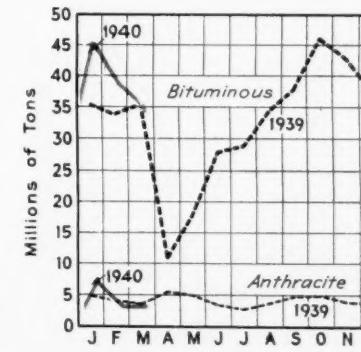
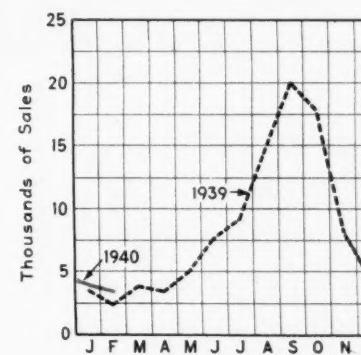
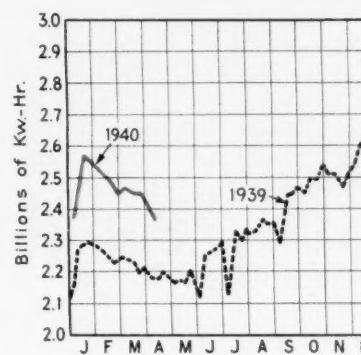
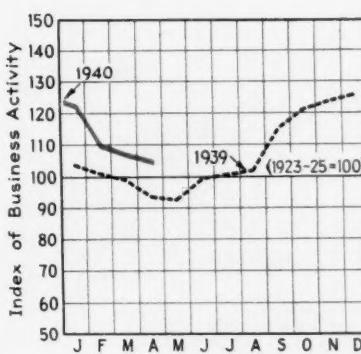
Output of energy by the electric-light and power industry continues to move in a curve approximately paralleling that of 1939, but about 10 per cent higher so far this year. Figures by the Edison Electric Institute for recent weeks are: week ended March 16, 2,460,000,000 kw-hr.; March 23, 2,424,000,000; March 30, 2,422,000,000; April 6, 2,381,456,000 kw-hr. All regions except the Southern and Middle Atlantic States showed decreases during the week ended April 6 from the preceding week.

COAL-STOKER SALES

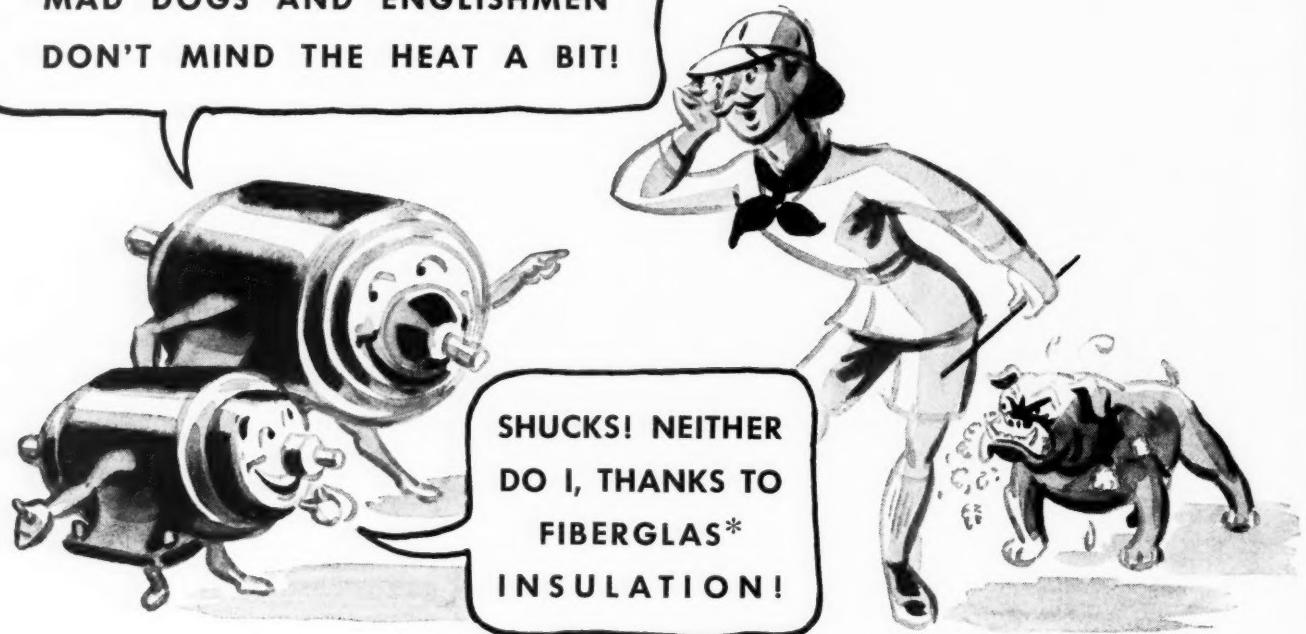
Mechanical stoker sales in the United States in February last totaled 3,456 units (U. S. Bureau of the Census from 104 manufacturers), compared with 4,059 in the preceding month and 2,612 in February, 1939. Sales of small units in February last were: Class 1 (under 61 lb. of coal per hour), 2,886 (bituminous, 2,575; anthracite, 311); Class 2 (61-100 lb. per hour), 254 (bituminous, 240; anthracite, 14); Class 3 (101-300 lb. per hour), 167.

COAL PRODUCTION

Bituminous-coal production by United States mines in March last (preliminary figures) totaled 35,400,000 net tons, according to the Bituminous Coal Division, U. S. Department of the Interior. This compares with output of 39,105,000 tons in the preceding month and 35,438,000 tons in March, 1939. Anthracite tonnage in March last was 3,773,000 (preliminary), according to the U. S. Bureau of Mines, against 3,546,000 tons in the preceding month and 3,604,000 tons in March, 1939.



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TOLEDO, OHIO

COAL AGE — Vol. 45, No. 5

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

Coal Age

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SYDNEY A. HALE, Editor • MAY 1940

Pertinent and Impertinent

- DO CONSUMERS buy coal or the man-power employed? Do they purchase heat units or a slice of the dollar volume annually expended by the industry for supplies? Will somebody please tell us?
- PUBLIC RELATIONS, said John W. Hill in an address before the Steel Founders' Society of America, "is not a commodity to be purchased like a new machine or to be applied like a new coat of paint on the factory walls. An organization may look outside for the skill and the expert guidance essential to the successful practice of its public relations, but, if the effort is to be effective, the essential policies must be deeply rooted within itself." This is not the first time this thought has been expressed by Mr. Hill and others. But it bears reiteration.
- POLLUTION, in popular parlance, is something poisonous, infective or in some other way disabling or fatal. Except to fish, however, mine water is none of these. Pollution is a strong word to use to describe the presence of an acid that is used for treatment of drinking water, prescribed by doctors as a tonic, helpful to the growth of certain crops, inhibitive or destructive to infective bacteria and added to water to prevent boiler-plate brittleness. Acidification would seem to be more descriptive and only when the acid is in large quantity does "pollution" appear justified.
- ESTIMATING that 32,000 scientists and engineers with 16,000 assistants are employed in technical research by private companies, Mellon Institute further pegs the chemical, petroleum and electrical industries as having devoted \$215,000,000 last year to their research laboratories. What research price was paid last year for the future glory of coal?
- SAFETY has been increased in railroad operations concurrently with increased speed. While it would be incorrect to ascribe greater safety to increased speed, the two are not incompatible on the surface and need not be in underground transportation. Subway travel, which has many of the advantages of mine transportation, has been notably safe from its inception.
- CIO welcomed April 1 with a five-page advertising section in the *Washington Times-Herald*. Two of the five pages hailed the United Mine Workers as "the shock troops of organized labor." Not so dumb. Washington may not be a great industrial center, but it is rumored that many national lawmakers spend considerable time there.
- SINCE WHEN have coal sales been so completely divorced from the general business of production and preparation that they are given neither time nor space in an over-all presentation of the industry's func-
- tions? As every operator knows, technical improvements may reduce costs considerably, but those savings—and more—may be dissipated through faulty sales technique. Coordination should not only extend from men and machines at the face to loading into railroad cars at the tipple but all the way through to the ultimate consumer if the greatest possible economic good is to result. Why not reunite these most important phases by frank and open discussion of both problems whenever and wherever coal men meet?
- LAST MONTH, on recommendation of Secretary Ickes, the President named Dr. R. R. Sayers acting director of the Bureau of Mines. Dr. Sayers is no stranger to Bureau activities and his past record commends him to the post. But why only acting director—an appointment which requires no Senatorial approval? Can it be that the doughty Secretary of the Interior shrinks from the possibility of a Congressional investigation of the Ickesian overlordship of the Bureau?
- SEARCHING of miners' pockets for cigarettes and matches prior to entering coal mines seems foredoomed to failure whether from lack of time, negligence, collusion or inadequacy of penalties. One almost foolproof precaution is that taken in some British coal mines and quite generally in metal mines. The men all have two lockers, one where they doff their street clothes and one where they don mine habiliments, and these are at remote parts of the bathhouse. Accordingly they go

naked from one part of the building to the other and inspection is easy, for only the armpits and fingers will retain the forbidden articles.

Help! Help!

WHEN railroad tariffs were given a new status of importance in 1906, personnel trained to ferret out all the exceptions, alternatives and cross-references in a tariff was eagerly sought after by purchasers of freight transportation. If minimum-price schedules in the form now recommended by trial examiners of the Bituminous Coal Division are made effective, an even stronger demand for men who can find their way through the federal price-labyrinth will arise. And, to complicate matters, men must be educated for these new duties; there is no reservoir of trained personnel from which to draw.

The proposed schedules poured out from Washington the past month cover more than 1,000 pages of prices. This total is exclusive of the schedules of Marketing Areas and Distributors' Discounts. No longer can the producer merely sharpen his own pencil and name a price which he thinks will corral the business. The hapless salesman must know not only the base price but what, if any, freight-rate absorptions are permissible or additions are mandatory. He must know, too, whether special prices on certain specific business are tucked away in these schedules. So armed with knowledge, he may land the order—if some unregulated fuel does not walk away with the prize.

Jumping the Gun

SUPPRESSING REPORTS of accident investigations honestly and expertly conducted can be neither applauded nor condoned by real advocates of mine safety. Amply documented, such reports should contribute materially toward reducing the accident toll. Broadcasting "preliminary progress" reports before the cause of the specific catastrophe under investigation has been definitely determined, however, is in a different category. This is particularly true

when such advance reports are studied with inference and innuendo.

The recent Bureau of Mines preliminary report on the Willow Grove disaster is a case in point. Inferential condemnation is therein visited on the mine for using black pellet powder and non-permissible type equipment. Whether these and other practices criticized are bad is beside the question. To the general public unfamiliar with mining practices and laws these Bureau pronouncements must carry the clear implication that one or more of the practices so frowned upon was responsible for the explosion. And this in the admitted absence of proof.

In creating such an impression, the Bureau is placed in the unenviable position of a jury that hands up its verdict before it has heard or studied the evidence. This may be smart publicity to stimulate support for a bill blessed by the Interior Department and the United Mine Workers. But it is hardly in keeping with the traditional American sense of fair play and justice. Or does that matter these enlightened days?

Real Progress

INITIAL RESULTS may not always be encouraging, but coal-mine management that tackles the job with zeal and sticks by it with unflagging enthusiasm sooner or later shows real and sustained progress in accident prevention. This is signally demonstrated in the safety records of the Union Pacific Coal Co. Statistics for 1923-1939, published in a recent issue of its Employees' Magazine, show an increase in man-hours per fatal accident from 348,615 hours in 1923 to 1,678,977 in 1939; for non-fatal accidents, the increase was from 19,446 to 134,318 man-hours.

Progress during the first ten years of this period was relatively slow. This was the period when the mechanization program of the company was getting under way. As the percentage of coal mechanically loaded increased, the general safety picture also improved. During the first five years the percentage of coal so loaded averaged 15.61, rising

from 3.32 in 1923 to 40.28 per cent in 1927; the five-year record on man-hours per accident averaged 444,776 for fatalities and 16,186 man-hours for non-fatal injuries. In the next five years the average percentage of the tonnage loaded mechanically increased to 63.18 and the man-hours per accident to 503,854 and 16,875, respectively.

For the 1933-37 period, the average percentage of tonnage mechanically loaded was 97.18. Man-hours per fatal accident jumped to 731,205, while the man-hours per non-fatal injury zoomed to 66,749. During the past two years, when the best records were hung up, all Union Pacific tonnage has been mechanically loaded. In terms of working years, the record for 1939 was one accident for each 84 years of mine employment.

Building Sales

WHILE the advertising committee meets to listen to grandiose proposals for selling the industry to an indifferent American public, the organization itself goes quietly on with a program primarily directed at the home owners, architects and builders. This program emphasizes not how great the coal industry is but how the products of that industry can serve the interests and the needs of the prospective customer. The 1940 campaign again pushes modern basement planning and, as a new feature, more abundant heat in the home.

That the campaign is clicking is evidenced by the inquiries received from advertisements in publications reaching the groups named. During January, for example, the Washington and Chicago offices of the association had nearly 200 requests for the basement-plan booklet and over 725 requests for its booklet on more abundant heat. And requests are still piling up as the campaign continues. Individually the American public is too engrossed with its own immediate and personal problems to give much heed to the problems of industrial groups which seem remote from its own sphere. But it is responsive when its own pocketbook or comfort is touched.

HOIST-OPERATED LOADERS

Surmount Tough Mining Conditions In Thin Coal in the Cranberry No. 1 Mine

WITH low coal, a wide variation in seam thickness, uneven grades and bad top among the difficult conditions characterizing the remaining territory in Cranberry No. 1 mine of the New River Co., Raleigh County, West Virginia, two experimental "Smith pit-car loaders" were installed last August and since have been producing cleaner coal at a higher efficiency than is possible with the hand loading which still accounts for the bulk of the output. Originally tried out at operations with which the inventor is associated, the Cranberry installation is the first with factory-built equipment.

A steel box riding on the mine floor and equipped with a self-dumping bottom is the essential item in the Smith loading system. The box is pulled from the face to a dump on the entry by head and tail ropes. The load is not contaminated by dirt from the bottom and no handling of the rope in and out of a snatch block is necessary. Along with the loaders, main haulage was improved by installing a rope to operate in an unusual hook-up with the existing main-line locomotives.

Cranberry No. 1 was opened 33 years ago by a shaft 485 ft. deep. The Sewell seam is recovered as a high-grade low-volatile coal for domestic and steam uses. Thickness ranges from 24 to 54 in. and the average now being mined is 38 in. Seam pitch is 3 deg. north and east and very irregular local grades commonly running up to 10 per cent and occasionally exceeding 15 per cent are encountered. Practically no gas is present but 5 tons of water is pumped per ton of coal hoisted. In October, mine production averaged 1,730 tons per day, derived

Latest in a series of mechanization experiments which started 20 years ago, two hand-loaded box-type carriers with automatic drop-bottom doors, sliding on the bottom and pulled to and from the face with a hoist, apparently are solving the problem of low-cost output from a section in Cranberry No. 1 mine characterized by thin coal, bad top and highly irregular grades. Nine-man crews average 75 tons per shift.

By J. H. EDWARDS

Associate Editor, Coal Age

from single-shift hand loading and double-shifted Smith loaders. Lump is hand picked and the tipple includes washing equipment for pea only.

Up to three years ago, the workings were under fair top consisting principally of slate but including some bone. Now, the bone averages 2 ft. and ranges from 0 to 6 ft. This top will stand in a room until the pillar has been pulled but if broken it all comes down. The bottom is fairly hard. Because top to roadway width must be taken in rooms in about three-fourths of the mine, yardage cost is making hand loading into cars prohibitive. The bottom is a fairly hard slate.

Something had to be done and the Smith pit-car loaders, which represent a relatively low investment, appeared to possess the necessary flexibility for

the low height and irregular grades while permitting continuance of the essential practice of hand cleaning at the face. These loaders are not the first effort to find a new cost-cutting system. Scrapers, for example, were tried twenty years ago, but were discarded because of coal breakage and digging into the bottom. Chain conveyors were thoroughly tested prior to 1926. Mechanical defects were among the reasons for their abandonment.

The two Smith pit-car loaders now working in the mine, locally dubbed "scooters," were made by the Enterprise Wheel & Car Corporation, under patents issued to Gilbert Smith, Fayetteville, W. Va., vice-president and general manager of the Mason, Dunedin and Fire Creek Coal & Coke companies (*Coal Age*, February, 1939, p. 85). The box measures 4x5 ft., is 12 in. high, weighs 275 lb. and holds a maximum of 1,500 lb. The bottom consists of two doors hinged along the sides and overlapping at the center. The deflector, which may be described as a three-toothed sprocket with a ball-bearing roller on the end of each tooth, can be disassembled into five light-weight pieces—three arms, hub with center bearing and roof jack. A third item is the dump, which is set up on the haulage heading. It consists of a 27½-deg. ramp, an angle-iron frame constituting the dump proper and a double-drum hoist driven by a 10-hp. Westinghouse varying-speed 1,150-r.p.m. 550-volt d.c. motor.

The frame (5x16 ft.) spans two loading tracks and can be adjusted in a minute's time to dump into cars on either track. Dumping and door reclosing are automatic. Both hoists



Here, a loaded box, traveling toward the camera, enters the deflector to make the turn and head out of the room.



John Thornton, fireboss, stands in front of the underground hoist room and alongside the rope which now works in conjunction with a 20-ton locomotive on the main haul.



Three men load the 12-in.-high box in a jiffy. Then, during the minute or so it is traveling to and from the dump they loosen the coal and pick out any refuse that may have fallen from the top.



H. S. Stickler, gang leader, points to the top of the coal in No. 2 airway in the same panel in which the loaders are working. Here, 5 ft. of top, consisting of bone and slate laminated with coal, had to be taken.

W. C. Thompson, superintendent, watches a box of coal dumped into a mine car.

originally were geared for a box travel (rope speed) of 285 f.p.m., but the speed of one unit has been increased to 315 f.p.m. This points to the possibility of even greater speeds if the larger motor and hoist do not unduly increase cost and reduce portability. Head and tail ropes consist, respectively, of 450 ft. of $\frac{1}{2}$ -in. and 900 ft. of $\frac{3}{8}$ -in. wire line. Two types of ropes have been purchased, but the type of stranding for maximum life and the influence of steel or hemp cores on performance have not been determined.

The two "scooters" are being used in adjoining rooms on the same side of the entry in a territory developed for room-and-pillar hand loading. They were started Aug. 19, have been operated two shifts much of the time and up to Oct. 31, 1939, had loaded 6,000 tons from four rooms and two pillars. Treacherous top has been encountered in spots and, although the coal thickness has averaged about 36 in. and reached 48 in. in places, 28 in. was mined for a distance of 50 ft. in one room. The loaders purposely were installed in a section where conditions were unfavorable. The troublesome top, locally termed "bone," for the most part consists of thin alternate laminations of coal and shale. Some true bone is encountered, however, and contains slips presenting a hazard difficult to detect.

The seam is free of partings but some of the bone and other top material comes down with each cut and must be picked out at the face. With the Smith loader the face men have an opportunity to clean the coal during the minute or so that the box is traveling to and from the dump. As compared to shoveling into a conveyor,

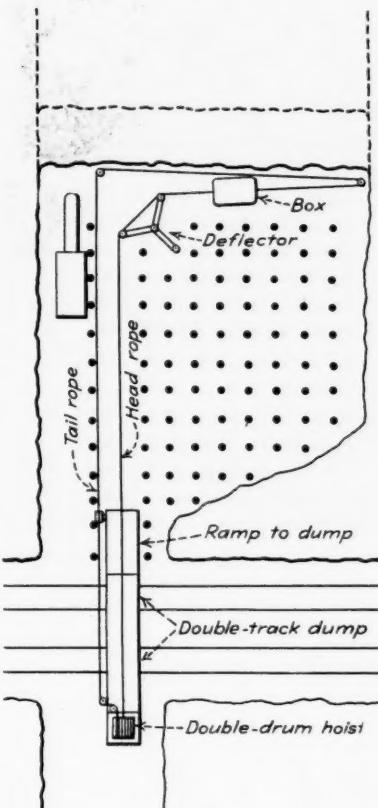


Fig. 1—Typical set-up for mining a 45-ft. room.

which offers no respite so long as the coal is available, filling the box is a job with a definite limit and consequently the men work with more enthusiasm. Noise is at a minimum and thus the roof action can be heard. And, as in other types of mechanical mining, the more rapid advance, compared to hand loading into mine cars,

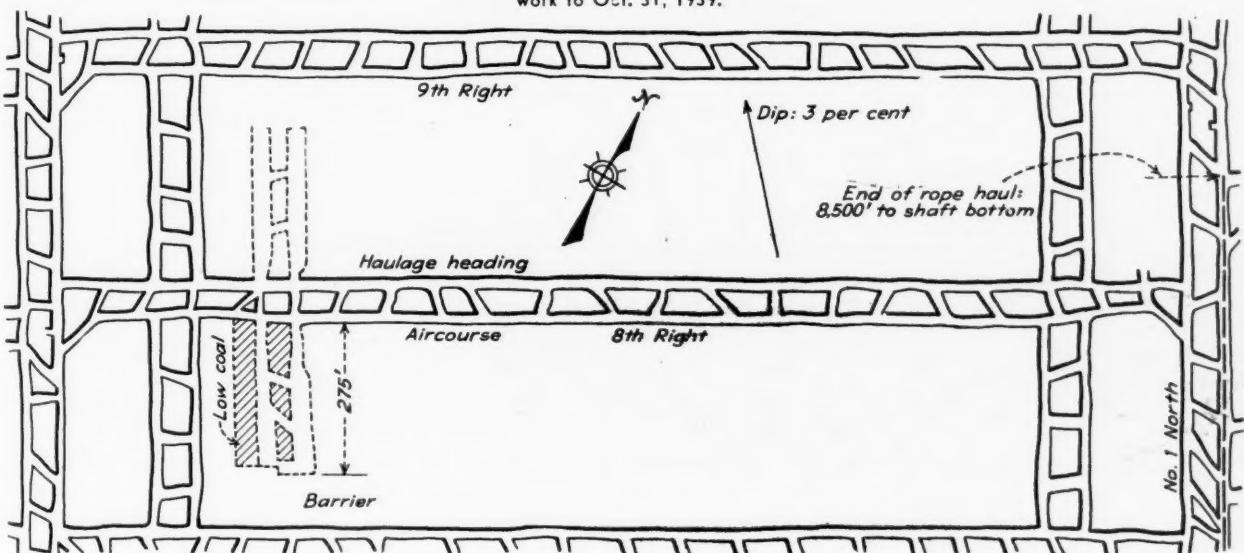
Fig. 2—Loaders were installed in a section previously developed for hand loading. Dotted lines indicate new work to Oct. 31, 1939.

means less time for roof weakening.

The general plan is to drive a 40-ft. room and bring back a 35-ft. pillar, but widths have been varied during this experimental period. Although the territory worked is developed for rooms 350 ft. deep, mine officials consider 275 ft. the most desirable and 300 ft. the practical limit for good efficiency with present equipment and rope speed. Heading width was increased from 11 to 16 ft. to accommodate two loading tracks. Cars are 51 in. wide and it now appears that a 3-ft. clearance between cars on the two tracks is more than necessary and that a heading width of 14 ft. will be ample. One single-track set-up is planned to provide time-study data for comparison with the double-track set-up to determine if the cost of the wider heading is more than returned in increased tonnage per man.

With the two-door box, floor-to-top height required in the duck's nest to accommodate the dump at Cranberry is 83 in. Mine cars are 27 in. high, 30-lb. rails and steel ties are used and a 6 in. clearance is allowed between opened doors and the tops of the cars. Each car is loaded with four boxes and the coal weight per car averages 4,400 lb., compared to 5,000 lb. with hand loading. A four-door box built by the coal company and tried for a while provided greater clearance and allowed loading a car to 4,700 lb. with three boxes. Lumps hanging in the openings were an objection, however. The two-door box readily discharges the largest lumps loaded. Such lumps, however, are not of undue size because of the friable nature of the coal.

Nine men, including a gang leader who directs and assists in all jobs,



constitute a shift crew for the two loaders, including a locomotive haul to a sidetrack supplying the main haul. Production averages better than 75 tons per shift. Thus, the efficiency, conservatively speaking, is 8.3 tons per man delivered to the main haul. In addition to the gang leader, two others, termed hoistmen, serve both loaders. From time to time, however, one hoistman takes loaded trips to the sidetrack and brings back empties, during which period he is relieved by the gang leader. Or the latter may operate the locomotive himself. Three men at the face do the undercutting, drilling, shooting and timbering and move the deflector and tail-rope sheaves. Posts and other supplies are transported to the face in the loader box.

Each place is provided with a Goodman shortwall with 7½-ft. bar using standard bits. Drills are Chicago Pneumatic No. 671 hand-held units with plain twisted augers. Permissible powder is used; because the top bone sticks to the coal in some places, a set shooting plan is impractical. The first shot, loaded with 2½ sticks, is positioned 12 to 18 in. from the rib end and 8 in. from the top. As a rule three other shots, each two sticks and likewise 8 in. down from the top, are fired to dislodge the coal in a 40-ft. room.

Timbers with not less than 4½-in. faces are set on 4-ft. centers and capped with 2x4x24-in. boards. Disturbing permanent posts to advance the equipment is unnecessary with this loading system. A Brown-Fayro 10-hp. 25-f.p.m. car-spotting hoist was



Gilbert Smith, inventor of the "Smith pit-car loader."

purchased, but was not used in mining, the first four rooms.

Prior to last summer's installation of an underground hoist the main haulage at Cranberry No. 1 was slow, expensive and none too safe. The grade averages slightly over 3 per cent and runs up to peaks of 5.85 per cent against the loads. A 20-ton locomotive formerly could handle but 25 cars. Sand use was excessive, maintenance was high and coal spillage was a troublesome factor. Now, trips of 35 cars are pulled jointly by the hoist and the 20-ton locomotive at a speed of 800 f.p.m. (9.1 m.p.h.).

The electric hoist, on the shaft bottom, is an all-steel Vulcan machine with a six-piece, 6-ft.-diameter, 8-ft.-

face drum especially built for underground use. It is driven by a General Electric 400-hp. 580-r.p.m. 2,300-volt induction motor. Roebling 6x19 Lang-lay 1½-in. rope was purchased. During October, 10,161 cars were hauled an average distance of 6,500 ft. The 20-ton locomotive trails the loaded trip as a pusher and heads the empty trips on the return. This eliminates danger from cars breaking loose and provides the desired flexibility at either end. Power cost was reduced in spite of adding 400-hp. connected load. Direct-current demand was decreased by an amount practically equaling the demand created by the 400-hp. motor and the kilowatt-hour requirements were more than offset by shutting down a 150-kw. motor-generator on the surface.

Gilbert Smith, inventor of the system used at Cranberry, had mined with it 130,000 tons up to Oct. 31 in 22- to 40-in. coal in the Fire Creek seam at Mason No. 1 mine on Piney Creek, Raleigh County. He started experiments in October, 1937, and in October, 1939, produced 5,554 tons with five units. In his case practically all items of the equipment were built or assembled at the mine and several design variations have undergone tests. Irregular bottom grades run up to 17 per cent and the mine is plagued with rolls coming down from the top and almost cutting out the coal. The top slate holds well in rooms if it is not broken in the mining.

Design Variations Tried

In collaboration with Mr. Smith, R. H. Morris, general manager, Gauley Mountain Coal Co., has experimented with several design variations, although following fundamentally the Smith idea. In the Jodie and Ansted mines, 13,000 tons had been handled by the Smith system up to Oct. 1, 1939. In November, the Leckie interests purchased four Smith loaders (Enterprise manufacture) for trials in low coal at Aflex, Ky., and Rita, W. Va.

At Cranberry No. 1, officials closely concerned with experimental work with the Smith loaders include Russel Allenbaugh, mine foreman; Zernie Campbell, mine electrician; and W. C. Thompson, superintendent. The executive staff, with headquarters at the Mount Hope office, includes Edward Graff, vice-president and general manager; J. M. McCauley, manager of mines; J. E. Howard, mining engineer; and Edgar H. Graff, assistant manager of mines and safety engineer.



Looking across the valley at Cranberry No. 1 surface plant from a point near a tower of the refuse-disposal tram.

SMOKELESS FUEL

Made From Illinois No. 6 Coal

In the New Millstadt Carbonizing Plant

FOR THE production of "Solarite" smokeless fuel from St. Clair County (Ill.) No. 6 coal, the Midwest-Radiant Corporation operates a 20-oven Curran-Knowles carbonizing plant served by a new strip mine and washing plant at Millstadt, Ill., about 15 miles east of St. Louis, Mo. Plant capacity is 350 tons of coal in 24 hours, yielding about 200 tons of Solarite, 1,250,000 cu. ft. of surplus gas (about 55 per cent of the total, the remainder being used to operate equipment and heat ovens), and 4,200 gal. of tar. Solarite sales are made from a truck-loading plant including crushing and screening equipment for making of 4x1½-in. furnace, 1½x¾-in. chestnut and minus ¼-in. breeze. The latter will be mixed with raw coal for recharging to the ovens.

The Solarite plant is an outgrowth of efforts to reduce air pollution in St. Louis and its environs. Convinced that production of an economical smokeless solid fuel from near-by Illinois coal was the best approach to the elimination of smoke and its attendant evils, a group of St. Louis men decided to make a start by building the Millstadt carbonizing plant. Coal production was a necessary incidental activity, and, to assure the cleanest possible raw material for carbonizing and also meet the growing demand for washed and otherwise scientifically prepared coal by Greater St. Louis consumers equipped to burn it efficiently and economically, a modern washing and screening plant was installed, along with an up-to-date storage and truck-loading plant. This preparation plant and the stripping operation supplying the coal will be described in an early issue.

Midwest-Radiant Corporation offi-

As a start toward solving the air-pollution problem in Greater St. Louis, the Millstadt carbonizing plant, using Curran-Knowles ovens, began production of a smokeless solid fuel Aug. 24, 1939. Plant capacity is 350 tons of coal in 24 hours, yielding, in addition to byproducts, about 200 tons of Solarite, which is prepared for market in a crushing, screening, storage and truck-loading plant.

By IVAN A. GIVEN

Associate Editor, *Coal Age*

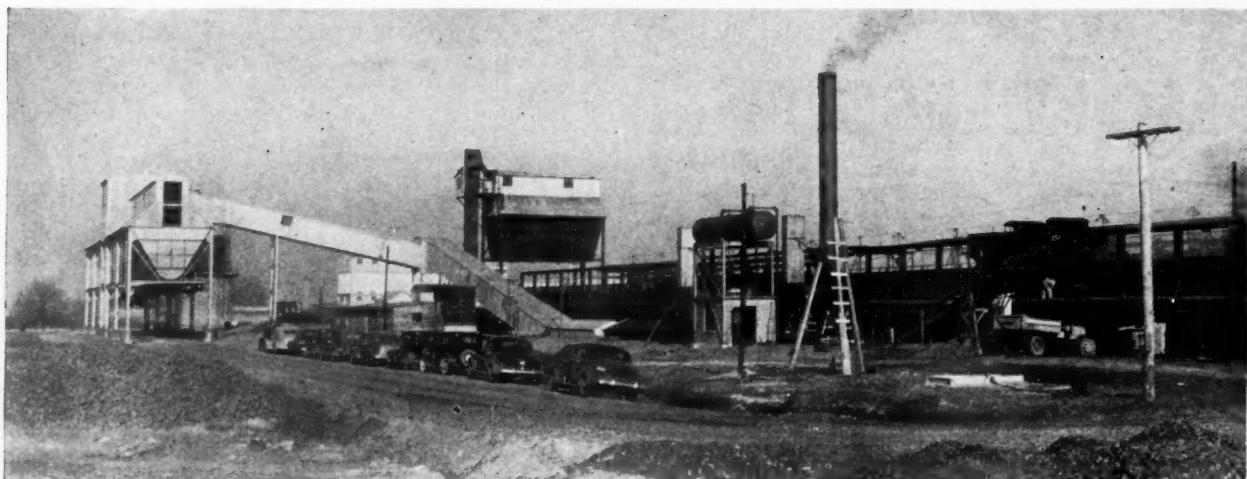
cials include Richard Baldwin, president; K. A. Spencer, vice-president in charge of mining activities; L. M. Atha, treasurer; and Henry P. Pflager, secretary. M. D. Curran, a member of the board of directors, is director of carbonizing operations. On the ground at Millstadt are Harold N. Hicks, resident manager of the coal division; H. W. Brentz, preparation manager; and William Sloss, superintendent of the carbonizing plant. B. J. Greenwood is superintendent of the West Frankfort (Ill.) "Carbonite" plant (*Coal Age*, November, 1934, p. 421), first to install Curran-Knowles ovens to produce smokeless fuel and now also owned and operated by Midwest-Radiant.

In the Curran-Knowles ovens used at West Frankfort and in the Millstadt

carbonizing plant, designed and built by the Coal Carbonizing Co., the coal is spread in a thin layer on the oven floor, which is heated from below. As the carbonizing zone moves upward, the volatile constituents, including the tars, etc., are driven off and tend to travel upward, before the heat can crack them, into the cooler upper layer of still-uncarbonized coal, where the tars and similar products condense out. This progressive volatilization and recondensation results in a strong agglutinating action even in coals classed as weakly or non-caking by other methods. But these ovens are not limited to such coals, as installations for carbonizing metallurgical coal have shown their ability to produce a superior metallurgical coke.

One Curran-Knowles coke characteristic is its high reactivity. In other words, the coke ignites quickly and holds fire easily—both important factors in a household fuel as well as in metal refining. This high reactivity, it is thought, is due to the formation of a new type of carbon molecule which much more easily combines with oxygen.

Major units in the Millstadt Solarite plant are two batteries of Curran-Knowles ovens (ten ovens per battery); a raw-coal receiving, crushing elevating and storage plant; oven-charging equipment; a coke crushing, screening, storage and loading plant; and tar- and gas-recovery plants. All equipment is operated by Buick "Master" or "Standard" automobile engines fueled with byproduct gas (special Coal Carbonizing Co. carburetors). Plant design provides for two more 10-oven batteries on the opposite side of the raw-coal bunker. Addition of these ovens will not increase the operating



force or auxiliary operating equipment.

Another major objective in plant design was lowest-possible-cost operating units. Examples are the coke pusher, representing only a fraction of the outlay for pushers used with conventional byproduct ovens; a gas-reversing machine for a few hundred dollars, compared with several thousand for some other types; coke-quenching equipment, etc. Consequently, the Coal Carbonizing Co. states, plants of this type can be built at a cost permitting a greater realization from converting small-sized screenings into smokeless fuel than generally is possible by selling them raw. Equipment such as flushing-liquor pumps, air blowers, flue- and oven-gas exhausters, etc., is installed in duplicate for normal operation when one is off for repairs.

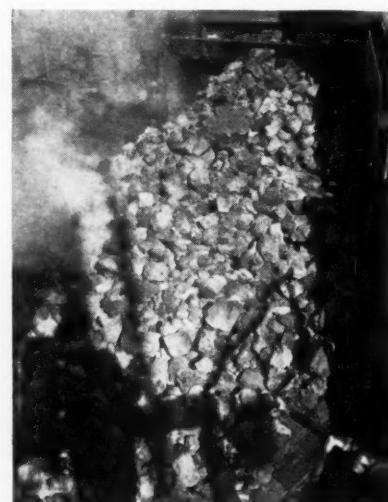
Coal for carbonizing, trucked from the washing plant, consists of either 1½- or ¾-in. screenings containing 8 to 8½ per cent ash, compared to 15 to 18 per cent before washing. Trucks dump into a 30-ton double hopper. A two-way reciprocating feeder places the coal in a Robins scraper-type elevating conveyor, which delivers it to two American Pulverizer Co. ring-hammer pulverizers, each rated at 35 tons per hour. The coal is reduced to minus ¼-in. and then is elevated to a Robins distributing conveyor over a 250-ton bunker spanning the ovens. In the future, fines recovered from quenching water will be dumped into a truck hopper and mixed with the breeze from the crushing and screening plant for reduction to 20-mesh and return to the oven feed, which then will be a mixture of raw coal and pulverized breeze. Thus, no breeze will be wasted for lack of a market.

Four duplex gates in the bunker bot-

Millstadt Solarite plant. Left is the crushing, screening, storage and truck-loading plant. Center is the bunker for raw coal for carbonizing. This and other illustrations in this article were made on Sunday.

tom deliver coal to the four compartments of the oven-charging car—running on rails on the oven tops. Eight chutes on the car deliver to eight charging holes in an individual oven. Oven length is 40 ft.; width, 9 ft. 9 in. Usual charge is 8½ tons, which is spread out in a layer about 12 in. deep by the leveler ram. Lift doors in each end of the oven are dropped and luted after charging. Carbonizing time at present is about 11 hours, although it can be reduced to 9 hours, if desired, as at West Frankfort, or increased to 14 to 15 hours. Volatile content of the coke is about 2½ per cent.

Air for the fuel-air mixture for oven heating is supplied by blower fans. This air is preheated to about 400 deg.



Hot from the oven—Solarite on the wharf before going to the crushing, screening and storage plant.

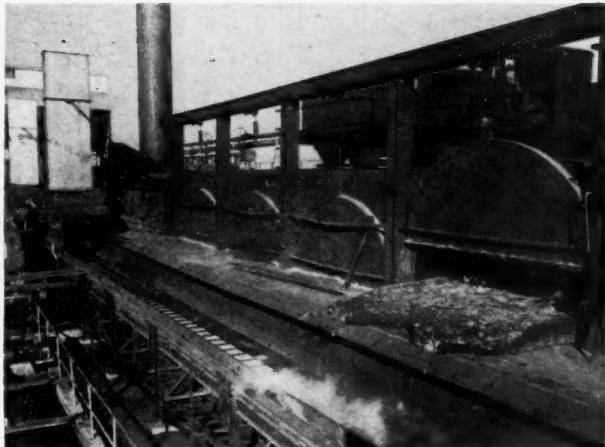
F. by passing it through openings under the oven floors. This preheating is one reason for the higher heating efficiency at Millstadt, where only 40 to 45 per cent of the gas yield is required for carbonizing, compared with 50 per cent at the older West Frankfort plant. Normally, each oven is fired from alternate ends in 30-minute periods using the gas-reversing machines noted above, one of which is installed for each 10-oven battery. However, firing periods for each oven end may be varied at will. Compressed-air cylinders do the gas reversing. Combustion gases are drawn from the flues by exhausters, which render a high stack to provide draft unnecessary. Exhaust-gas temperature is around 550 deg. F., another indication of oven-heating efficiency. Each battery has its own fuel-air blowers and flue-gas exhausters.

When carbonization is completed, the coke is pushed out into a special metallic conveyor (one per battery) designed by the Coal Carbonizing Co. The pusher and also the charging car are driven by gas engines fueled from storage tanks mounted on the units themselves and charged once a shift. The hot-coke conveyors are of chrome-nickel alloy and run in cast-iron troughs fitted with water jets to keep the chain cool. The coke is carried through a hood fitted with quenching sprays and then is discharged into a wharf between the two oven batteries. Quenching water goes to a settling tank from which the fine breeze is removed by a scraper conveyor. Overflow water is recirculated, with fresh added as necessary to maintain the volume.

From the wharf a Robins belt-conveyor system carries the coke up to the crushing and screening plant on top of the storage and truck-loading bunker.



Showing charging car on the tops of the ovens with the raw-coal bunker in the background.



Here, upon completion of carbonization, a charge of Solarite is starting out of the oven.

Here the coke goes into a Coal Carbonizing Co. double-roll crusher for reduction to 4 in. and smaller. The crushed coke is run over a rotary grizzly to take out the furnace size ($4 \times 1\frac{1}{2}$ in.)—distributed to two large storage compartments by a shuttle conveyor. Minus $1\frac{1}{2}$ -in. goes onto a Gyrex vibrator which splits it into $1\frac{1}{2} \times \frac{3}{4}$ -in. nut, stored, via a spiral lowering chute, in a third compartment, and minus $\frac{3}{4}$ -in. breeze, which falls into a fourth compartment.

Total bunker capacity is 400 tons. Duplex gates are installed every 6 ft., and coke is loaded into trucks by a traveling belt-type boom. Both the boom and the shuttle conveyor naturally are powered by gas engines, in these cases fed through flexible hose. Coal Carbonizing designed the entire crushing, screening, storage and loading station.

Gas is exhausted from the ovens by one of two Connersville-type roller-bearing exhausters, with an Askania

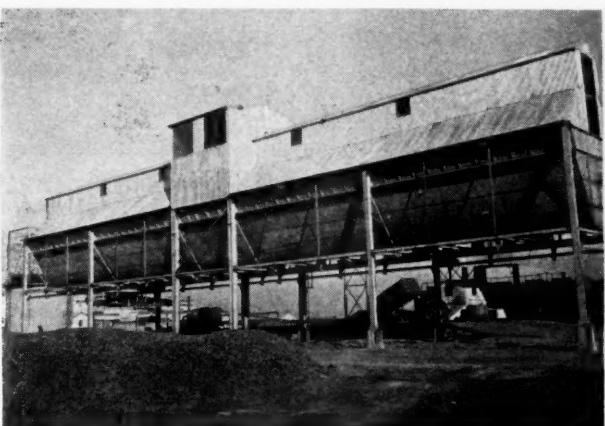
air-cylinder-operated governor to regulate the suction. Before the gas reaches the exhauster, however, it passes through a Peabody mechanical washer where most of the tar is removed. A second Peabody washer following the exhauster completes tar removal. Then the gas goes into a 10,000-cu.ft. gasometer which keeps a pressure of 9 in. of water on the mains to the oven burners and engines. A small desulphurizer cleans the gas engine.

A closed system of handling flushing liquor is employed. Liquor from all points in the plant drains to a settling basin, where the tar goes to the bottom, while the hot liquor overflows to a storage tank. One of two Fairbanks-Morse centrifugal pumps forces the hot liquor to the top of a 30-ft. forced-draft cooling tower equipped with a 10-ft.-diameter 6-bladed airplane-type fan. Another F-B pump returns the cooled flushing liquor to the Peabody washers or other necessary points in the byproduct-gas system.

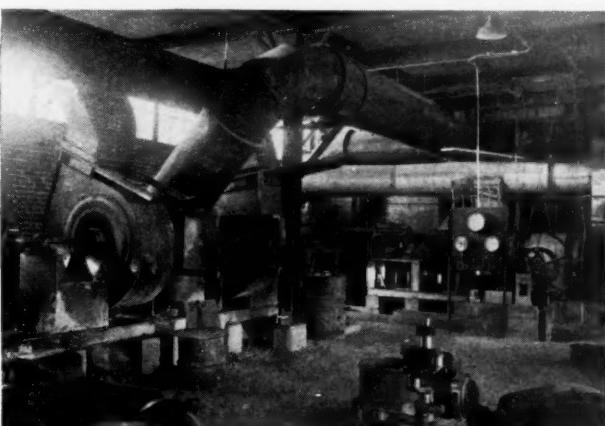
Total moisture in the coal charged to the ovens at present is about 20 per cent, to be reduced to 14 to 16 per cent (4 to 5 surface) by drying equipment scheduled for the washing plant. The water required to saturate the gas from the ovens cuts the quantity of flushing liquor just enough to require a small volume of fresh make-up water, which keeps the flushing system in good shape. Make-up for both flushing and quenching comes from the pond also supplying the washing plant.

Tar recovery averages 14 gal. per ton of coal carbonized, and yields about 65 per cent tar-acid oils and 35 per cent pitch at 365 deg. C.

The carbonizing division of the Millstadt plant received its first charge Aug. 24, 1939. In addition to a truck-loading supervisor and the superintendent, each one shift, daily operating labor comprises twelve men on the ovens (four per 8-hour shift), three mechanics, three helpers and three foremen.



Solarite truck-loading plant, with the traveling loading boom at the far left. In the background, a truck is dumping a fresh load of washed screenings from the Millstadt preparation plant.

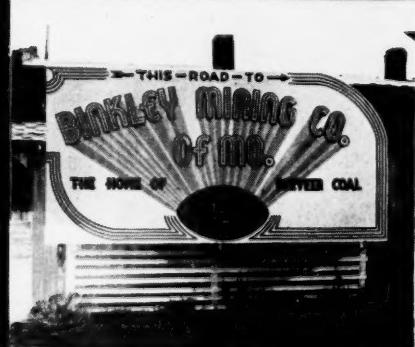


Operating units, installed in duplicate, are driven by automobile engines fueled with byproduct gas. Right, behind the meters, is a machine for reversing the fuel-air feed to the ovens.



SOME OF THE GREAT NAMES IN MINING

As the highway traveler sees them



ARMCO BARGE PLANT

Cuts Coal-Moving Cost 87c.

And Employs Portable Conveyors for Loading

MAKING possible a combination of rail and river coal transportation at a much lower rate from its Nellis (W. Va.) mine to the Armco plants at Hamilton and Middletown, just north of Cincinnati, Ohio, the American Rolling Mill Co. now operates a barge-loading plant of unusual design on the Ohio River at Huntington, W. Va. Completed in the summer of 1939, the new plant provides an opportunity for moving coal at a rate of \$1.25 (two rail hauls and river transportation), compared with \$2.12 for all-rail transportation. The margin available for terminal and river costs and savings therefore is 87c. Standardized heavy-duty portable conveyors working on an incline, or ramp, on the river bank meet the problem of a 39½-ft. variation in river stage during loading and towing.

River elevation at the low-water, or pool, stage is 505½ ft. Elevation of the tops of the railroad rails on the bank is 549 ft., making the vertical difference 44½ ft. The dump house and Armco tracks are on the river side of a concrete flood wall 14½ ft. higher than the tracks. This section of the flood wall includes a gate through which a service track connects with the railroad switch tracks.

A concrete pit with watertight floor and walls (see Fig. 6) accommodates a dump hopper, feeder and stationary elevating conveyor. Resting on rails on the ramp are two portable conveyors and a stacking conveyor. A fifth conveyor, operating practically horizontally and mounted on a turntable on a spar barge, delivers the coal from the stacker to the river barge. Hoppers, feeder and all conveyors were made by Barber-Greene. The ramp from the concrete pit extends down to a point a few feet from the

Employing a spar barge and portable conveyors operating on a ramp on the bank to take care of variations in river stage, the Armco barge-loading plant at Huntington, W. Va., has a loading capacity of approximately 250 tons per hour. Other features of this unusual plant, saving 87c. in freight, include the use of watertight electrical controls and special high-water storage of conveyors.

water's edge at pool stage. The pitch is 13 deg. 45 min. and the total length is 108 ft. Pairs of I-beams providing 20-ft. spans and resting on concrete piers support four 60-lb. rails laid on 7x9-in.x16-ft. ties.

The cycle of operations in taking care of an increase in river stage is as follows. The first step is to elevate the discharge end of the stacker conveyor (*G*, Fig. 6) until the maximum pitch of 18 deg.—31 deg. and 45 min. with respect to the ramp—is reached. Then, if the water level comes up above 519 ft. (13½ ft. above pool), Unit *E* (Fig. 6) is removed from the ramp and Units *F* and *G* are hauled up the ramp to fill the gap. Then, if the water level exceeds 532 ft. (26½ ft. above pool), Unit *F* also is removed and the stacker conveyor, *G*, then receives the coal directly from the pit-elevating conveyor, *D*.

The next question is how the portable conveyors are handled and where they are stored during high water. As can be seen in Figs. 3 and 4, an I-beam

over the top of the ramp carries at its outer end an 8-ton chain block. A second block of the same size is suspended from a trolley operating on the same beam. With this latter block the roof of corrugated galvanized Armco iron over the outer end of the concrete pit may be removed to make room on its supporting structure for storing Conveyors *E* and *F*—side by side and out of reach of high water up to 555 ft. (49½-ft. rise).

As the water approaches a stage of 549 ft., at which point the concrete pit would be flooded, the electric motors driving Units *B*, *D* and *G* would be removed, along with the electric cables, following which the watertight covers would be screwed over the receptacles in the central control station (Fig. 7). As the conduit connections also are watertight, the controls are protected against flood damage.

Conveyor belts (5-ply Goodrich) are 36 in. wide. Lengths of the various units are given in Fig. 6. At a belt speed of 350 f.p.m., barge-loading capacity is 325 tons per hour or better. Under the railroad track at the dumping point is a 13x26-ft. two-compartment hopper. A 30-in.x5½-ft. drag-flight feeder under each compartment moves the coal to the inclined pit conveyor in the center. Net capacity of the terminal is 250 tons or more per hour if only 50-ton cars are received; it is increased somewhat as the proportion of 70-ton cars increases.

The welded-steel spar barge (Figs. 1, 2 and 5) is 120x24x5 ft. in size. Supplied by the Treadwell Construction Co., the barge is equipped with four 18x18-in. spuds 45 ft. long. Built-in equipment, with motors and gearing below deck, consists of two American Machine & Engineering Co. winches. The Barber-Greene turntable



Fig. 1—Showing, from a barge in the river, the spar-barge and conveyor arrangement while loading at the pool, or low-water, stage.

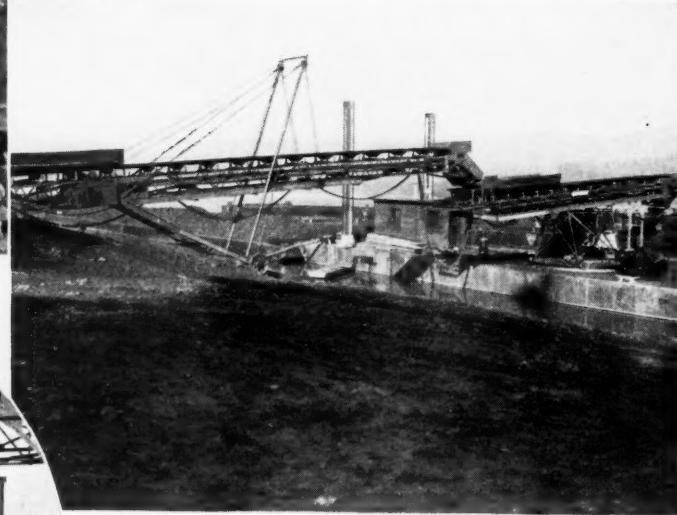


Fig. 2—The stacking conveyor spans the distance from shore to spar-barge conveyor.

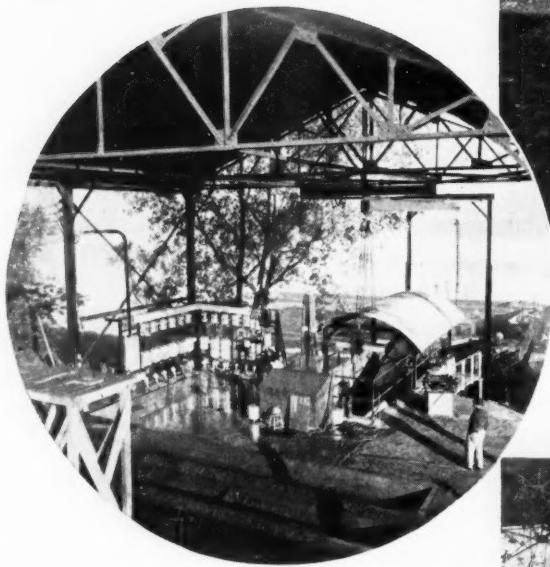


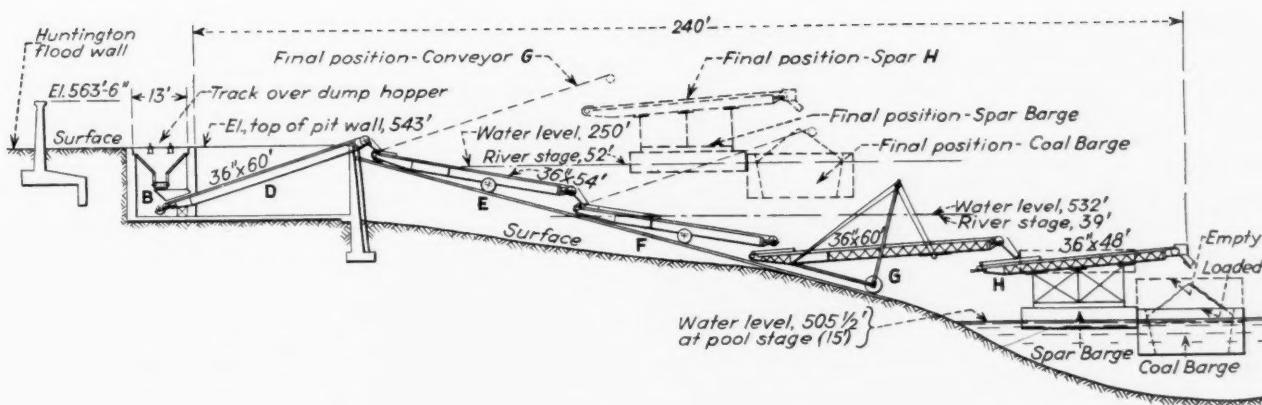
Fig. 3—Showing the track hopper and, in the background, the cover over the elevating conveyor, which may be removed to permit storing Conveyor Units E and F (Fig. 6) during flood stage.



Fig. 4—The I-beam and chain blocks permit hoisting Conveyor Units E and F and storing them when high water requires that they be taken off the ramp to make way for the stacker.



Fig. 5—Turntable supporting the spar-barge conveyor, with the harbor boss at the control station.



supporting the 60-ft. permanent conveyor is anchored by a king-pin at the center and by four screw-down deck anchors out near the track. The turn-table permits swinging the conveyor parallel to the barge axis when the spar barge is to be moved and also facilitates bringing the end of the conveyor back out of the way if a boat is to be tied alongside.

Connected horsepower of the plant motors totals 90, and the list includes a 1½-hp. Fairbanks-Morse deepwell turbine pump stored away for pit dewatering when necessary and a 1-hp. W. F. Stuckerman portable bilge pump for dewatering barges. Three-phase power is purchased at 220 volts. A 5-hp. Reliance totally inclosed gearmotor drives the feeders, with Delco totally inclosed fan-cooled 1,800-r.p.m. units on the conveying equipment—15-hp. on Elevating Units *D* and *G* and 7½-hp. on Units *E*, *F* and *H*, which operate nearly horizontal. Westinghouse 15-hp. totally inclosed gearmotors drive the winches.

Switches and starters are grouped in the dump house. Conduit from a pole accommodates three 300,000-

Fig. 6—Broken lines indicate spar-barge and stacker positions for loading at the highest river stage.

circ.mil cambric-and-braid-insulated conductors terminating in a bus of the same cable in a long steel box. Service is through a Westinghouse waterproof outdoor-type circuit breaker rated at 300 amp. at 600 volts a.c. Each motor is served by a 30- or 60-amp. Square-D watertight safety switch and a watertight Westinghouse De-ion limestarter with thermal overload protection. Connected to the conduit below each starter is a Crouse-Hinds "Arktite" receptacle from which conduit is run to the respective motors. Four-conductor cables are used, with the fourth wire in each case a ground conductor tied straight through to the frame of each equipment unit.

When a start button is pushed, the feeder and five conveyors start in rapid sequence. Starting and stopping may be done from either the dump house or a control platform on the spar barge. Winches are controlled at the spar barge and their individual

starters, mounted back on the bank with the rest, are the only reversing units. Seven of the fourteen Anaconda portable rubber-covered cables extend all the way down the ramp, the longest being 365 ft. Sizes are Nos. 6, 8 and 10.

Capacity of the terminal tracks is 32 empties and 32 loads. A 50-ton steam locomotive does the switching. Twelve men, including supervisors, a clerk, a resident foreman, or watchman, and the day laborers, constitute the crew for single-shift loading. For each extra shift worked per day, men must be added as follows: one locomotive engineer, three dumpers, one of whom acts as a switchman and closes car doors, one greaser and clean-up man and two bargemen.

River transportation is handled by 30 new arc-welded steel barges each carrying 1,000 tons at a 9-ft. draft. Built by the Marietta Manufacturing Co. and the St. Louis Shipbuilding Co., the barges have over-all dimensions of 175x26x11 ft. Towing is done by the Steamers "Leona" (430 hp.) and "Richard" (300 hp.) chartered from R. J. Hiernaux & Sons. Tows, depend-



Fig. 7—Controls, conduit and cable connections in the dump house are watertight, including plug-and-receptacle cable terminals, to prevent flood damage. Dump-house siding had not been installed when this illustration was made.

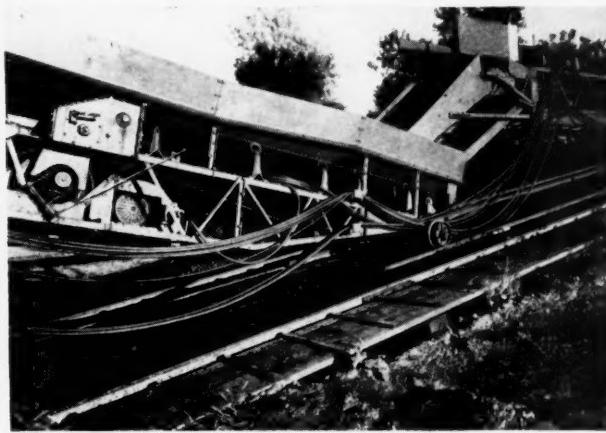


Fig. 8—Showing the rubber-covered power and control cables along the conveyors on the ramp. When the conveyors must be pulled up the ramp to take care of rising water, the extra footage is coiled up and looped in the side hooks.

ing upon loading and river conditions, consist of six, eight or nine barges. With the river at pool stage, 4½ to 5 days is required for a round trip.

Coal for the Hamilton byproduct plant is unloaded at Delhi, better known as St. Joe, on the Ohio River nine miles below the Southern Ry. bridge at Cincinnati. The river distance is 172 miles and the Baltimore & Ohio rail haul from St. Joe to Hamilton, taking a 70c. rate, is about 28 miles. Byproduct coal from the Nellis mine goes into Huntington ter-

minal via the main line of the Chesapeake & Ohio Ry. on a rate of 55c.

Steam coal for the Middletown plant, arriving at Huntington from other southern West Virginia mines via the C. & O., is unloaded at the Fulton terminal 159 miles by river from Huntington and 1½ miles above the Louisville & Nashville R.R. bridge at Cincinnati. The 28-mile Pennsylvania rail haul to Middletown takes a 70c. rate. Terminals of the River Transportation Co. are used at both St. Joe and Fulton. All coal from Huntington

goes to either the Hamilton or Middletown plant.

J. C. Miller, Armco vice-president, fathered the idea of the Huntington terminal and river transportation. F. E. Vigor, of Middletown, is general traffic manager. Capt. Phil C. Elsey, of Huntington, known as the designer of stern-wheeler tunnel-type boats, laid out the Huntington project and now is superintendent of the terminal and river equipment. His local assistants are Capt. W. E. Dunaway and H. S. Ellsworth.

SIMPLE AS "RULE OF ROAD"

Are the Shaft Signals Displayed On the Dial of This Anthracite Mine Hoist

RED LIGHT for danger (stop) and green light for clear (go) are today well-recognized highway signals, and their meaning is familiar to all who use the public roads. What is more natural than that these well-established indications should be applied to mine-hoist signals, as was done during the recent electrification of the Henry coal-shaft hoist of the Lehigh Valley Coal Co., in the anthracite region.

Since the introduction of electric signals in mine hoisting, more and more gadgets have been added to give the engineer an indication of the condition or position of the various parts of the hoisting equipment. The first electric signal consisted of a bell in the engine house, controlled by push-buttons at the cagers' positions. It soon became evident that it was desirable to differentiate the signals of the headman from those of the footman, so a bell and buzzer were installed. If the cages were being hoisted from several levels, an indication of the level from which the signal originated was soon found necessary; hence, an annunciator, with drops for the head and for the several levels, was provided.

Increasing the number of signals to the hoisting engineer when hoisting from more than one level gives him a complete knowledge of his duties but may distract and muddle him, especially if the signals are not concentrated where he can view them in a single direction. E. B. Wagner has so rearranged the signals at one of his shafts and simplified them that the hoisting engineer without thought can grasp their significance.

By E. B. WAGNER

Electrical Engineer
Lehigh Valley Coal Co.
Wilkes-Barre, Pa.

When coal was hoisted from two or more levels in a shaft, experience soon demonstrated that an indication

in the engine room of the position of the fans (keeps) in the hoisting shaft added greatly to safety of operation. This was accomplished by installing red and green lights within the range of the hoisting engineer's vision, operated by contacts on the fans, or keeps. Green lights indicated a clear hoist-way, permitting the hoisting engineer to move the cage in the shaft without interference. Shaft repairmen also required a special-toned bell or buzzer so that they could control the movements of the cage while repairs were being made. This was quite satisfactory so long as the engineer remembered to listen only to the repair signal and to ignore the usual hoisting signal should the latter be sounded by some member of the night-shift mine crew.

The engineer, therefore, in one instance had to listen to two signal bells, look at an annunciator, glance at the signal lights of the fans, or keeps, and in his spare time watch his indicator pointer and caging marks on the hoist drums, a rather tiring series of observations when repeated five hundred to a thousand times per shift.

To simplify hoisting procedure as

much as possible, it was suggested that all signaling be done by lights, and, to minimize the number of points to be scanned before starting to hoist, to locate all these signal lights on the hoist indicator. This would permit the engineer to concentrate his attention upon this single device until the last turn of the drum, at which time he would watch his drum marks so as to bring the cage to the exact position for landing.

Fig. 1 shows a partial view of the hoist indicator, equipped with markers and signal lights, giving the indication that the right-hand cage is at the surface landing and the left-hand cage at the first level. Tips of the markers for the first and second levels of the right-hand cage can just be seen through the intervening parts. The two rectangular objects on the indicator face are the automatic reset contacts which are operated by their respective pointers as they pass over them on their upward movement.

Markers Can Be Changed

At each landing position of the indicator pointer, a combination marker and signal-light holder with one red and one green lens was placed around the circumference of the indicator dial. The markers were attached to the dial by setscrews so that adjustments for changes in position due to rope stretch could be made with ease.

Fig. 2 shows, diagrammatically, an indicator so equipped, for hoisting from two levels, *M* and *R*, and landing the cage on the surface, *S*. It also shows the positions of the fans in the shaftways. The abbreviated marks on the wiring diagram designate the respective contacts. A two-pointer indicator, one pointer for each drum, is desirable in order that the automatic reset contact will not operate until the hoist has just about finished its travel. This gives the operator, until the cage is almost completely hoisted, a continuous indication of the signal he at first received.

The operation of the signal is as follows: With power on and the system in proper operating condition, a red light will appear at each of the indicating points around the dial. Assume that the cage is being hoisted from the bottom level. When the footman has his car properly caged, he pulls his signal switch. This lights the green light at the *R* marker on the down-cage side, showing that an inside signal has been received, and if the fans, or keeps, at the *M* land-

ing are back out of the way, the red light at both the *R* and *M* markers will be extinguished on both sides of the dial.

If a red light remains, it indicates that the fan, or keep, at that level, and on that side of the shaft, is in a

position to interfere with the movement of the cage and should be inspected. As soon as the headman pulls his signal, the green lights at the surface markers show up, and the red light on the down-cage side is extinguished.

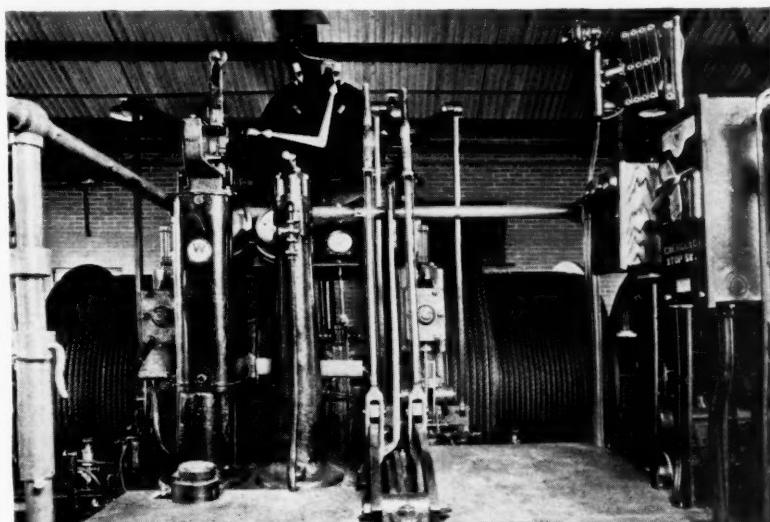


Fig. 1—Partial view of hoist indicator with markers and signal lights.

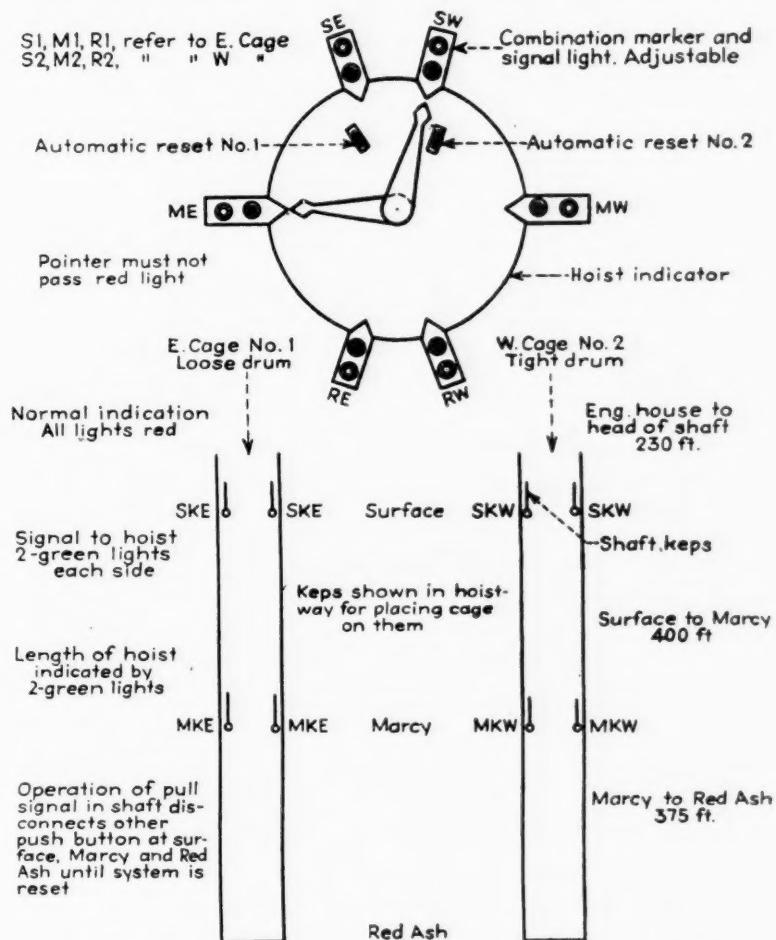


Fig. 2—Arrangement of indicator signal lights and shaft-keep contacts.

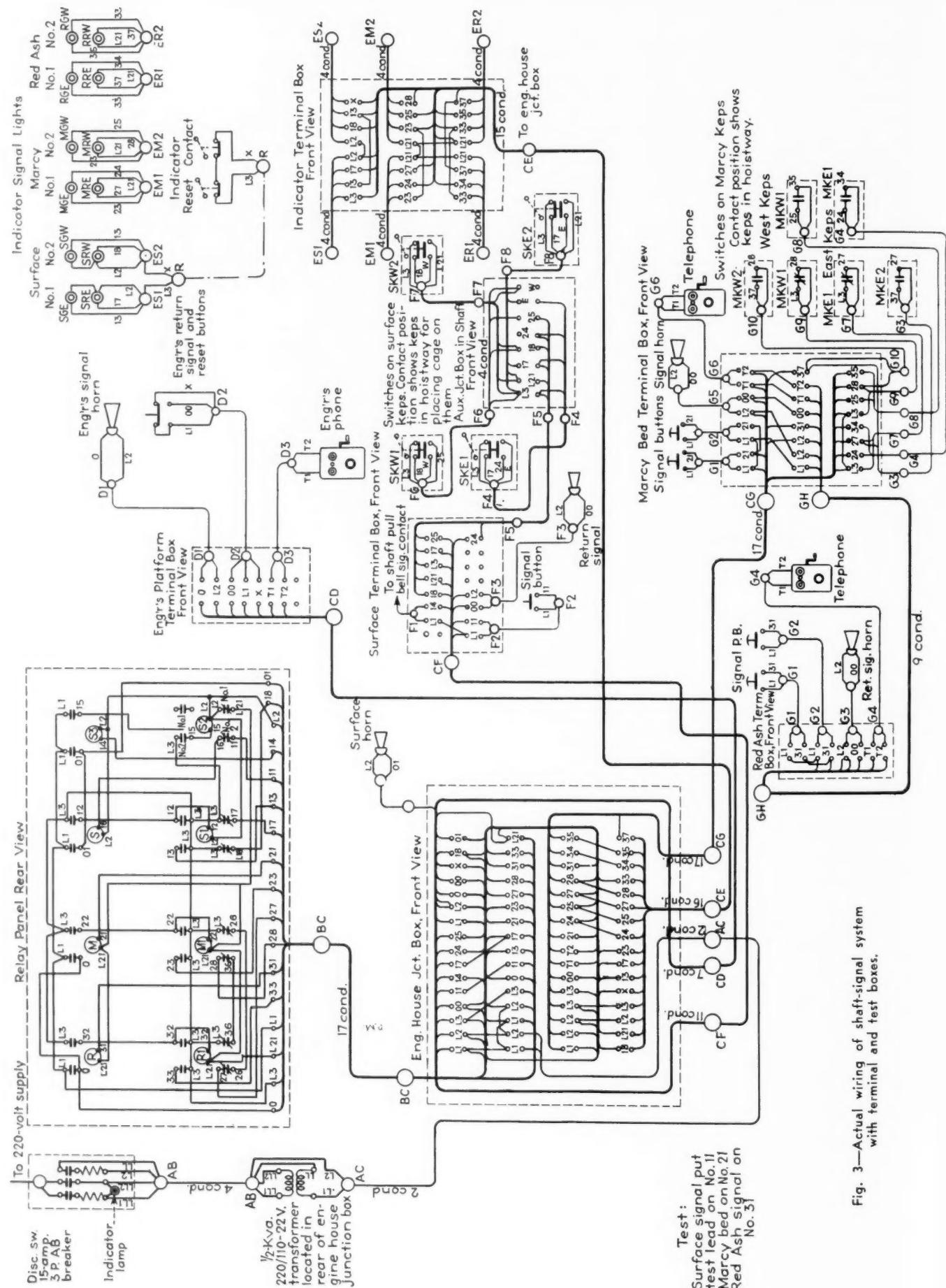


Fig. 3—Actual wiring of shaft-signal system with terminal and test boxes.

If he can release his fans, or keeps, without the necessity of lifting the cage slightly, he pulls them in the clear position, extinguishing the remaining red light at the surface position. The engineer then has two green lights on each side of the indicator dial, showing all is clear and ready for a hoist.

It can thus be seen that the instructions to the engineer are very simple and are: First: move the pointer from one green light to the other, and second: "never pass a red light."

When hoisting from the intermediate landing the red lights on this marker will burn continuously, a combination of red and green at this point showing when the hoist is to be made. This does not interfere with the above rule, however, as the pointer for the down cage moves away from the red light if the hoist is started in the proper direction, while that on the up cage should approach the red light on its side and stop when the red light is reached. When the hoist travel is just about completed, the reset contact on the side of the cage which is being hoisted is opened by the indicator pointer, resetting the signal by returning all lights to red in readiness for the next hoist.

Pull Wire for Repairs

When the shaft repairmen go on duty, they signal the engineer by means of a pull wire extending from top to bottom of the shaft. This operates the contact marked "Shaft Pull" and on the first operation disconnects the head and mine-level buttons so that a signal cannot be given from these points until the engineer operates his reset button, which drops out the relays and restores the signal for normal service.

For those readers who may desire to try out this system in actual practice, an elementary wiring diagram is shown in Fig. 4, while the actual wiring of the system together with the terminal and test boxes is shown in Fig. 3. The system is operated at 22 volts from a 500-watt transformer. The relay panel is inclosed in a steel cabinet and located in the basement of the hoist-engine house. Each relay is provided with a glass cover and rubber gasket which excludes all dirt, so that the relays themselves require little attention. The indicating lamp sockets are of the double-contact, bayonet type, to prevent loss of contact which the vibration of the hoist occasions if a screw-base lamp is used.

The bulbs used are 6-watt, 32-volt, Type S-6, double-contact, bayonet base, and give adequate illumination on 22 volts, with very satisfactory life.

The system has been in service for

fifteen months and by its reliable operation has entirely overcome the initial objections of the hoisting engineers, who at first were skeptical of a change from the familiar methods of the past.

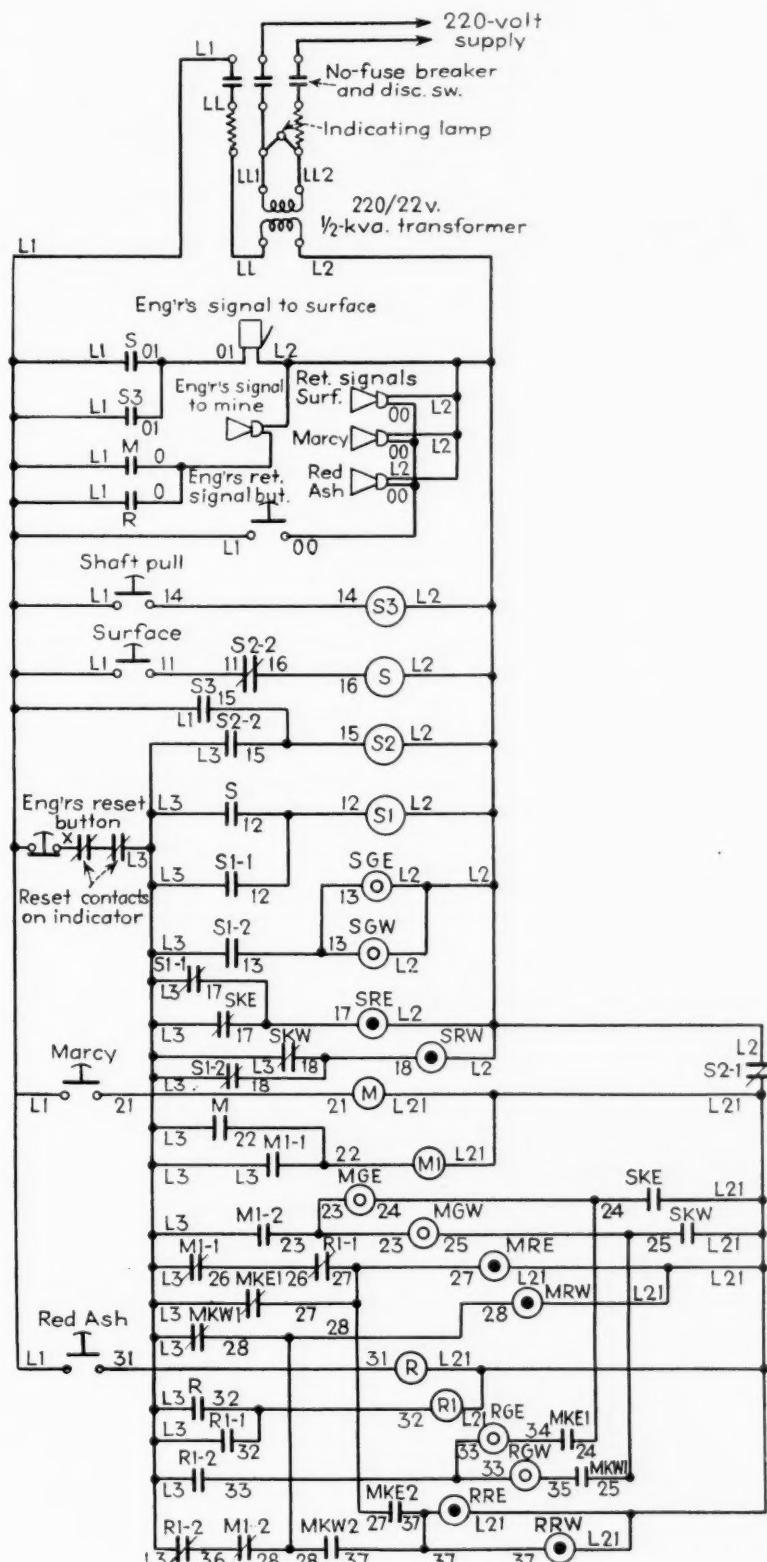


Fig. 4—Elementary diagram shaft signal.

TAILORED PREPARATION

Provides for Crushing to 5/16 In. And Dedusting Everything at Jefferson No. 20

WITH the reopening of the old Nason mine, at Nason, Ill., the Consolidated Coal Co. rechristened it Jefferson No. 20 and installed additional preparation equipment permitting, among other things, crushing the entire output to minus $\frac{5}{16}$ in. and dedusting it at 10 mesh. In making the additions, the original shaker screens were retained, two loading tracks were added to the three already in service, with a sixth track for dust; a mixing conveyor and crusher were installed for making combinations or breaking all coarse coal to 2 in.; and a complete fine-coal screening, dedusting, distributing and mixing plant was built, supplemented with crushing equipment for breaking $2 \times \frac{5}{16}$ -in. coal to minus $\frac{5}{16}$ for loading or recirculation and dedusting. A magnetic pulley removes tramp iron from all minus 2-in. coal, and all sizes may be dustless-treated. Supple-

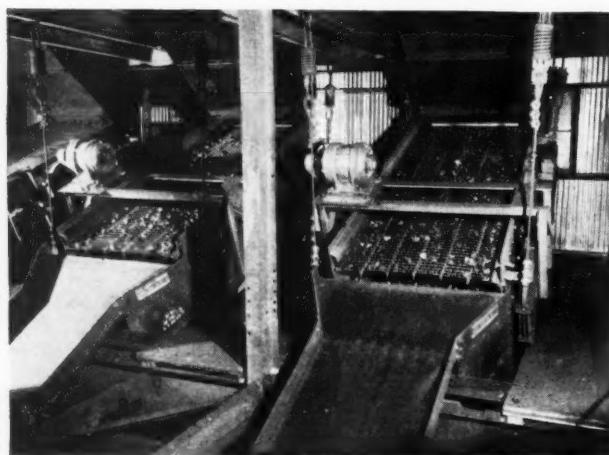
Stoker sizes tailored to order and provisions for crushing the entire mine output to 5/16 in. and dedusting it at 10 mesh, if desired, are the results of preparation improvements following reopening of Jefferson No. 20 (formerly Nason) mine in 1938. New facilities to make this possible include crushing and mixing equipment, vibrating sizing and dedusting screens, and an unusual installation of proportioning gates.

menting the main plant is a four-bin 400-ton truck-loading plant.

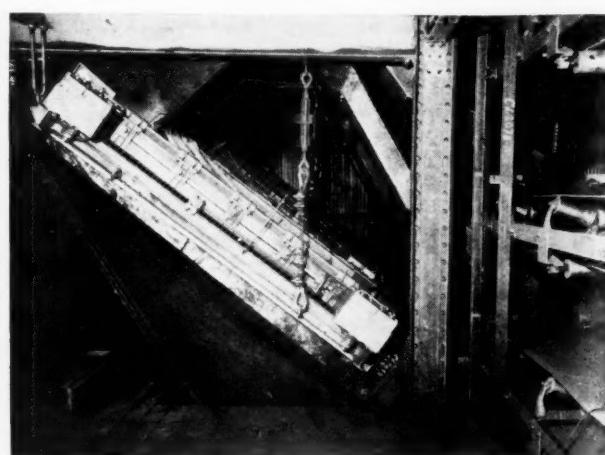
Coal from Jefferson No. 20, recovering the Illinois No. 6 vein in Jef-

erson County, is dumped into a weigh basket and fed onto the mine-run shakers. Mine rock is dumped through a gate into a separate rock hopper, from which a belt conveyor takes it through a tunnel under the preparation plant to a truck-loading station. The main shakers separate the mine-run coal into 6-in. lump, 6x3-in. egg, 3x2-in. nut and a minus 2-in. resultant. Lump, egg and nut go onto three apron-type picking-table loading booms, which were part of the original tipple, designed and built by C. C. Wright in 1921, when the mine originally opened.

Picking is arranged to yield pure rock and bony material. Artificial light is supplied by new Westinghouse combination fixtures (mercury-arc and incandescent lamps). Pure rock or other pure refuse goes directly to the refuse belt. Bony material, however, drops into a Pennsyl-



Primary screening of minus 2-in. coal is done on these vibrators in the new Jefferson No. 20 rescreening and dedusting plant.



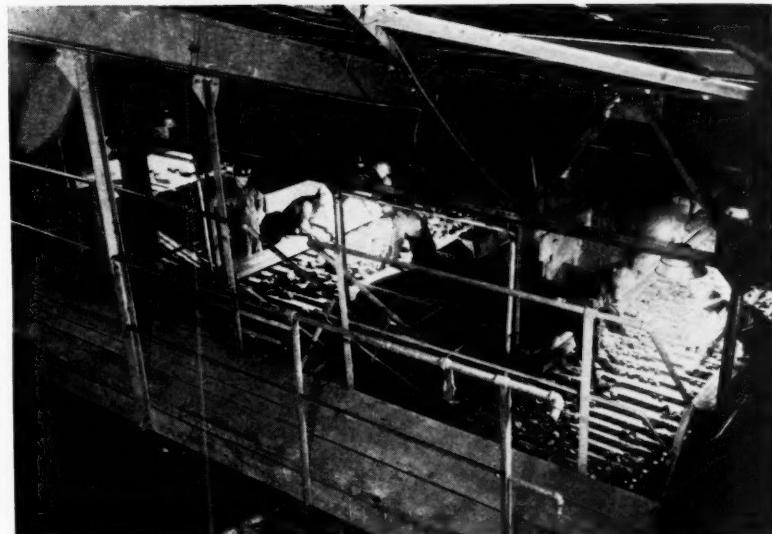
Electric dedusting vibrators are installed under the primary vibrators. At the right are some of the assembly belts.

vania crusher set above a belt in the same tunnel for reduction to 2 in. for boiler fuel. The bony belt, discharging into a new boiler-coal belt, also can receive minus 2-in. from the main shakers and/or 10-mesh dust from the dedusting screens. Thus, coal values are salvaged and the shipped product can be improved without loss.

Picked lump, egg and nut may be loaded separately over their respective booms, or the booms may be raised to discharge one or more or all three sizes into the bottom strand of a new mixing conveyor for making combinations up to and including a hand-picked mine-run. Also, by raising the booms still higher, one or more or all three sizes may be discharged into the top strand and conveyed to a crusher for reduction to minus 2 in. This crusher discharges to the bottom strand, which carries the product to a transfer belt to start it through the rescreener.

An entire new rescreener and auxiliaries, designed by Robins, was built to screen, dedust, remix, distribute and otherwise prepare minus 2-in. coal for market. Incidentally, the rescreener structure was welded throughout, bringing Consolidated into the group adopting this type of fabrication. Minus 2-in. coal from the mine-run shakers moves down a back chute to a short transfer belt also receiving minus 2-in. degradation from the three coarse sizes and minus 2-in. coal made by crushing any one or more or all the lump, egg and nut sizes.

The transfer conveyor carries the minus 2-in. coal over a Dings magnetic pulley for tramp-iron removal,

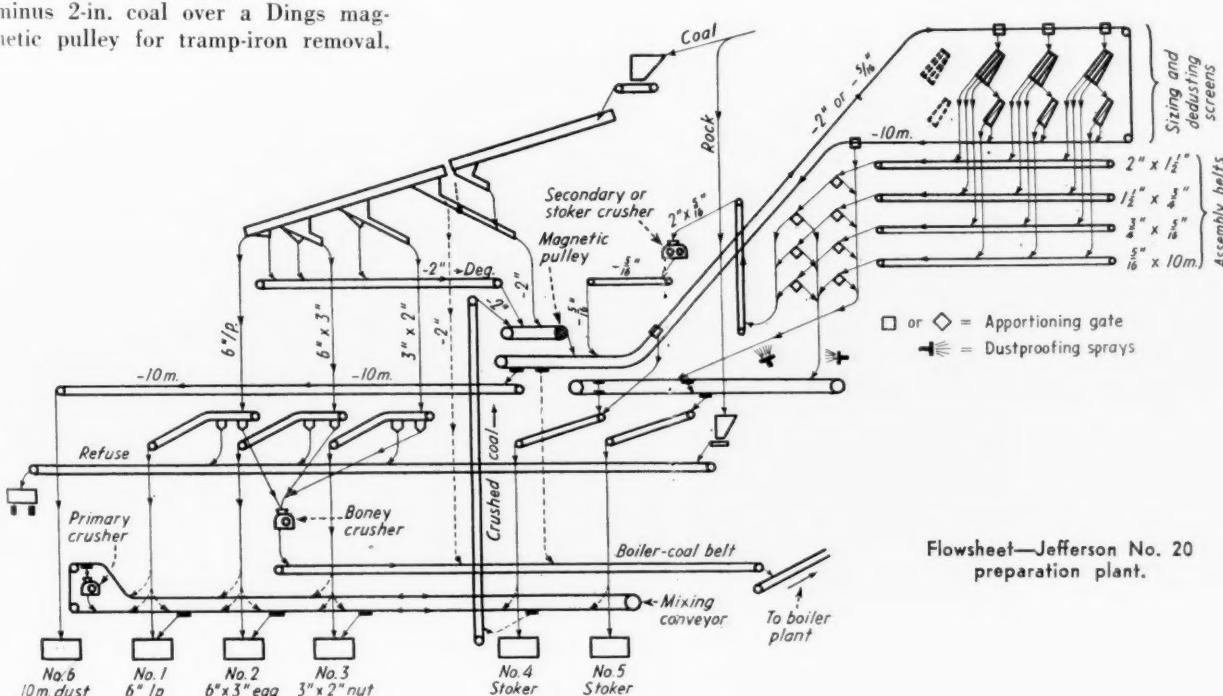


Coarse sizes are hand-picked on equipment installed in the original plant.

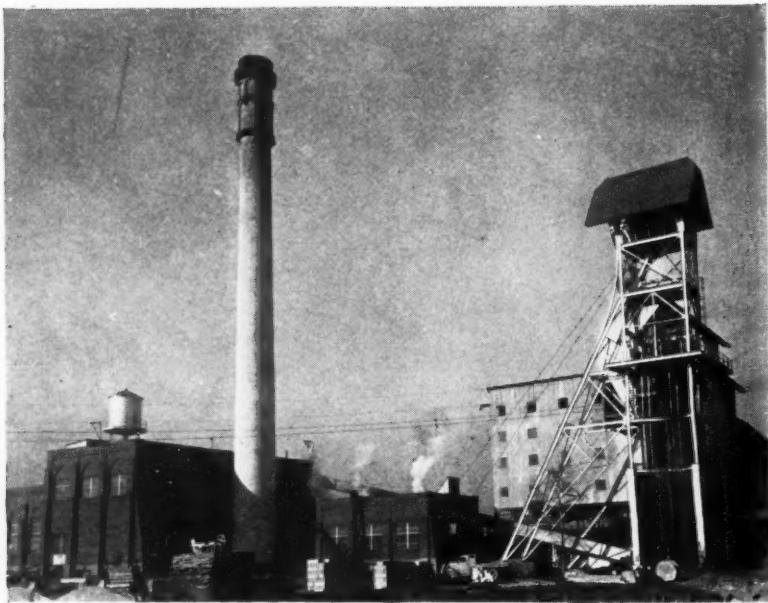
the coal falling into the top strand of a scraper-type feeding conveyor serving the rescreener. A gate, however, permits loading all or any part of this size on No. 4 track before screening, if desired. But if screening is done, the coal is carried up to three double-deck Gyrex vibrating screens (a place is provided for a fourth in the future) which separate the 2-in. feed into $2 \times 1\frac{1}{2}$, $1\frac{1}{2} \times 3\frac{1}{4}$, $\frac{3}{4} \times 5\frac{1}{8}$ and minus $\frac{1}{8}$ -in. fractions to facilitate dedusting and later remixing in such proportions as may be desired. The three larger sizes go to three belt-type assembly conveyors, one above the other. Minus $\frac{1}{8}$ -in. coal drops onto three Tyler 400 elec-

tric vibrating screens for dedusting at 10 mesh. The dedusted coal goes onto a fourth assembly belt, while the 10-mesh dust drops into the bottom strand of the feeder conveyor, equipped with a gate to permit any desired proportion to be recombined with the other sizes. With this gate closed, however, dust normally goes onto another conveyor to No. 6 track, although it may be diverted to the bony belt for boiler fuel.

The assembly belts following the vibrators discharge into a nest of apportioning gates which can send all of the two resultant sizes to No. 4 track and none to No. 5, or vice versa. Or the gates can split the sizes



Flowsheet—Jefferson No. 20 preparation plant.



Jefferson No. 20 topworks. The new fine-coal screening and dedusting plant is just left of the headframe. Truck-coal bins will be added in the foreground.

to each track in any desired proportion. Thus, it is possible to load a size on one track with all the fractions strictly proportioned and run the resultant to the other. Or part or all of one size may be loaded on one track with the rest on the other and so on through an infinite range of combinations, including, on No. 4 track, combinations with all or part of the minus 10-mesh dust, as indicated in the accompanying flowsheet.

Two mixing chutes receive coal destined for, respectively, Track No. 4

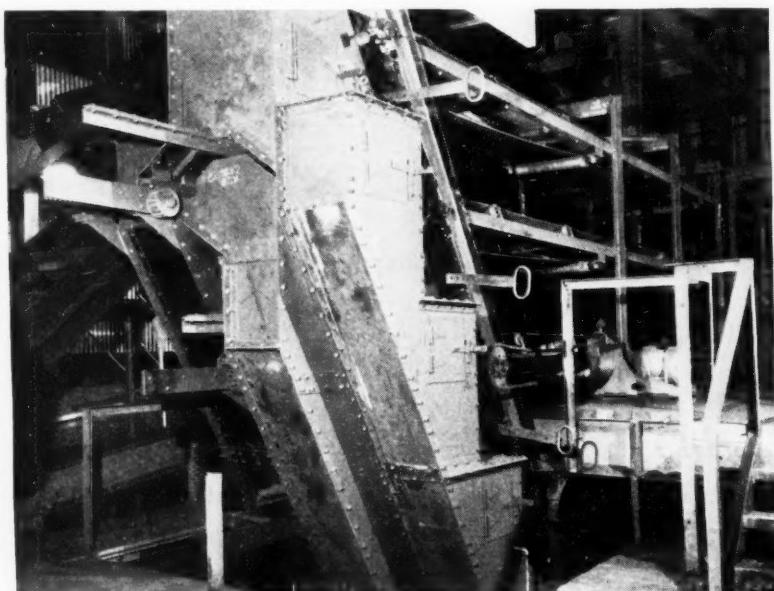
and Track No. 5. Coal from one chute goes on the top strand of a scraper-type transfer conveyor across both tracks and thence to a new loading boom over Track 4, while coal from the other chute goes on the bottom strand to a new loading boom over Track 5. Or, by means of a gate in the top strand, both sizes may be run to Track 5.

The above, however, does not exhaust the rescreener possibilities, as any one or all three of the $2 \times 1\frac{1}{4}$, $1\frac{1}{4} \times 3\frac{1}{4}$, and $3\frac{1}{4} \times \frac{1}{16}$ -in. sizes in any desired

proportions may be discharged, by means of proportioning gates, onto a transfer belt leading to a Robins double-roll fine-coal sizer, which reduces the feed to nominally minus $\frac{1}{16}$ in. and returns it to the rescreener feeder conveyor to find its way eventually to Tracks 4 and 5, or 4, 5 and 6 in case the coal is being shipped minus the 10-mesh dust. Thus, by crushing lump, egg and nut as outlined above and running it to the rescreener and then crushing the three largest rescreener sizes it is possible to reduce the entire output to minus $\frac{1}{16}$ in. and rescreen it to remove 10-mesh material. This means that the dedusting screens are capable of handling the entire mine output, expected ultimately to be 400 tons an hour.

The truck-loading plant at Jefferson No. 20 comprises four 100-ton steel bins for lump, egg, nut and stoker, which are brought over from the main plant, one by one, by a belt conveyor fed from the mixing conveyor. Spiral lowering chutes are provided for all but the stoker size, and loading is done over degradation screens.

Both truck and rail shipments may be treated with an emulsion of "Duo-sol" extract and water. Two tanks are provided, one feeding the system while a new batch of treating fluid is mixed in the other. Steam-jacketed pipes carry the emulsion to the sprays, which are located, as far as possible, so that the fluid is applied while the coal to be treated still is tumbling through the air.



Assembly belts in the new rescreening and dedusting plant bring the various sizes to the nest of apportioning gates at the left, where the desired final sizes are made.

BLOCTON 9 REOPENED

With New Surface Plant and Washer To Supplement Conveyor Work Underground

WITH a complete new plant and the underground equipped for conveyor mining, Blocton No. 9 mine, in Bibb County, Alabama, has been reopened after a nineteen-year shutdown. Only equipment left at the property was the mine rails, and these, being of sizes unusually large for their time, are serving the new plant. Capacity of the tipple, including a washer for two sizes, is 200 tons per hour. Rooms are mined with shaking conveyors and the mine cars are handled from conveyor loading points to the tipple by two single-rope hoists. Cutting machines, conveyors, hoists and all other items of equipment are driven by a.c. motors, thus affording a simplified electrical distribution system.

This second opening of Blocton No. 9 is by the Black Diamond Coal Mining Co., of which C. S. Bissell is president. Main and operating offices are in Birmingham and C. S. Blair is vice-president in charge of operations. The company also operates the Blue Creek mines in Jefferson County, Alabama, and the Marion mine, in the Jellico field, Claiborne County, Tennessee. The two executives just mentioned hold similar positions with the Atlas Coal Co., which operates the Atlas mine, near Middlesboro, Bell County, Kentucky.

Black Diamond leases Blocton No. 9 from the Tennessee Coal, Iron & Railroad Co., which opened it in 1914 and closed it in 1919. After several months of operation in 1922 the mine was closed again, but it was kept pumped until 1928 and then allowed to fill with water to the portal of the slope. Black Diamond started pumping the property in April, 1938, produced the first coal the next October, and has

Starting with the mine rails after a shutdown of nineteen years, the Black Diamond Coal Mining Co., to secure the lowest cost and the best possible product, installed mechanical - mining equipment underground and mechanical-cleaning equipment on the surface in reopening the Blocton No. 9 mine. With two slope hoists to bring cars to the surface, the coal, 36 in. thick, is mined with shaking conveyors.

By J. H. EDWARDS
Associate Editor, Coal Age

increased the production to 700 tons per day. This work restores, in a measure, to the community an industry which saw its heyday there in about 1907.

This mine is in the Woodstock seam, ranging from a trace to 6 ft. in thickness and averaging 36 in. in the rooms of the present workings. It is situated on the west side of a synclinal basin and the pitch is 10 per cent to the southeast. Farther down these Woodstock workings will extend under the Thompson seam (interval 400 ft.) It is thicker and originally covered a large area in the center of the basin. This Thompson coal was worked out many years ago by the Tennessee company and these old workings, now full of water, present a hazard which prob-

ably will forestall any attempt to get high recovery in the deeper workings of Blocton No. 9.

The Woodstock coal is devoid of regular parting but is topped with 2 to 4 in. of rash which falls with the coal and is the principal reason for the washing plant. Above the rash is a firm slate ranging from a few inches to 5 ft., and this in turn is topped with a strong and massive sandrock. No gas is encountered in the present workings.

Conveyor equipment consists of eight Goodman G-12½ shakers, 79-strokes, "A" motion, adjustable stroke, non-reversing, and two LaDel shakers, also non-reversing. Each conveyor includes pans for a room 400 ft. deep, a 90-deg. turn, and additional pans for a 50- to 70-ft. face.

From two entries leaving the "back slope" on nearly opposite sides rooms are driven straight up the pitch 400 ft. The centers are 75 to 90 ft. and the width is 40 to 50 ft. If thicker than normal coal is encountered the rooms are widened to more than 50 ft., thus adding to the recovery percentage.

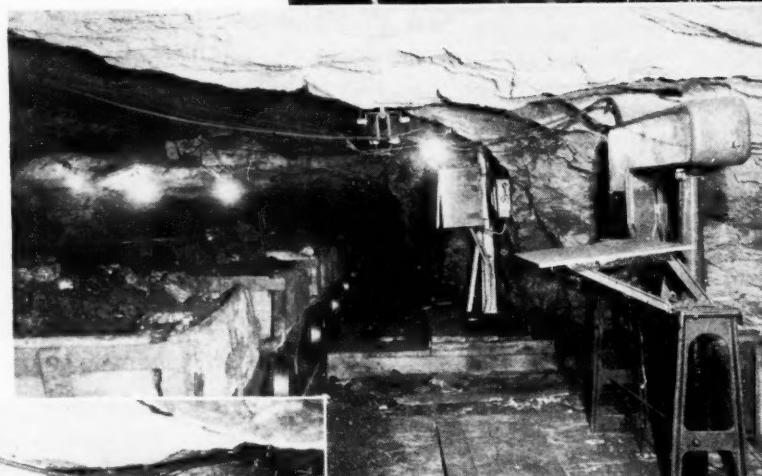
Rooms are worked out in 30 days and the experience to date is not sufficient to foretell what is to be expected as to roof action. Room posts, set on 3- to 4-ft. centers, are transported from the heading to the face on dollies riding on the pan line and pushed by hand.

Undercutting is done with one Jeffrey 24B longwall, two Goodman 212-G-3 shortwalls, six Sullivan CE-7 shortwalls and three Sullivan CE-8 longwalls. Shotholes, placed one at each rib and one or two near the center, are drilled with six Little Giant No. 572 drills. Herco "C" and du Pont "Lump Coal CC" permissible



Face conveyors are operated through 90-deg. turns. This No. 2 room off Fourth South is being driven 65 ft. wide. The 10-hp. drive is situated at the room neck.

This type of room shaker has a 15-hp. motor.



An automatic car scale is installed at the bottom of the front slope, which leads up to the tipple.



Shaker conveyors work 50x400 ft. up a 10-per-cent pitch. This is a 10-hp. unit. In the extreme lower right-hand corner appears one of the room blowers with fabric tubing leading to the main run of steel tubing.



are used. This shooting is done on shift and the work is on the "continuous-cycle" basis.

Three of the Goodman shakers are driven by Crocker-Wheeler motors and the other five by Allis-Chalmers motors. The LaDel shakers are equipped with Allis-Chalmers 15-hp, 1,160-r.p.m. motors of the double-cage ART type with ball bearings.

Room ventilation is provided by blowers, eight of which are the Jeffrey centrifugal type and two the LaDel-Troller type. Westinghouse Type CS 1½-hp, 1,730-r.p.m. motors drive the centrifugals. The usual arrangement is to use one 25-ft. length of du Pont Ventube next to the blower and conduct the air the rest of the way with 9-in. galvanized steel pipe made up in 10-ft. lengths. Main ventilation, 32,000 c.f.m., is supplied by a Jeffrey centrifugal fan driven at 140 r.p.m. by a 50-hp. motor.

Future cross entries, off which rooms are to be turned, will be driven a maximum of 4,000 ft. from the slope and will be directed to provide a 1½-per-cent grade in favor of the loads.

New 1-Ton Cars Used

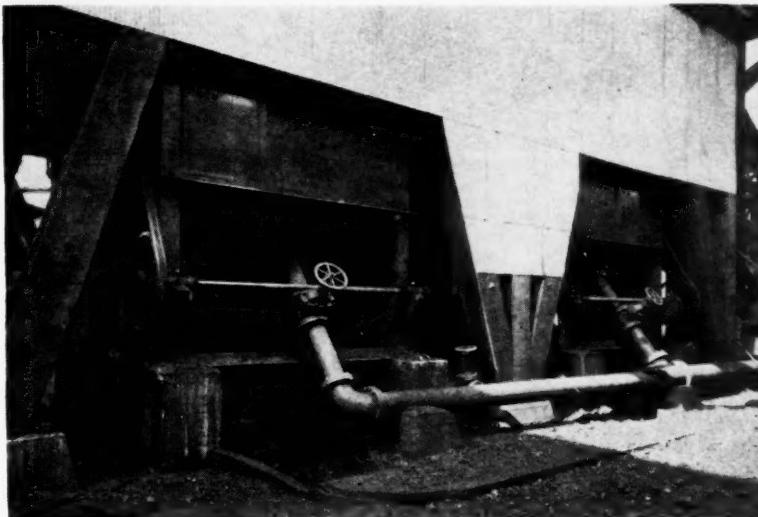
Transportation equipment consists of 350 solid-body swivel-coupling new wood cars built on solid-roller bearing trucks. Average loading is one ton, washed-coal basis, and the maximum is about 400 lb. over that. Hoists are installed to serve each of the three cross entries now in use and a fourth hoist is now being installed on another cross entry. Fifteen cars at a time are pulled up the back slope by a 350-hp. electric hoist installed underground.

The clutch-type drum of this hoist is 7 ft. 9 in. in diameter, 6 ft. wide and is now equipped with 4,000 ft. of ¾-in. rope. Driving it through a Fawcett herringbone gear is a 350-hp. 514-r.p.m. 2,300-volt General Electric wound-rotor induction motor. Grid resistance, air-break reversing switches and the contactor panel board also are General Electric equipment.

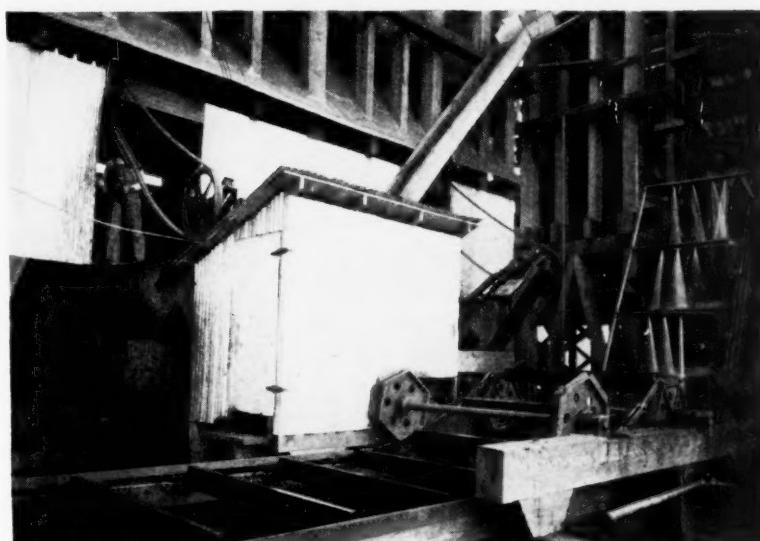
At the bottom of the "front, or rock, slope"—leading up to the tipple—two barneys are used for handling the loads and empties. Here also is situated the Streeter-Amet mine scale, with automatic weighing and recording attachment of the same make. Five-car trips are pulled up the 50-per cent rock slope into the single-car rotary dump (Link-Belt) by a 100-hp. Flory single-drum hoist situated on the outside. This haul is 400 ft. and the five cars are dumped in one minute as the trip is let back through the dump. Maximum hoisting and dump-



At the right is the concrete collar of the "front slope," out of which the mine cars are pulled on the way to the rotary dump in the tipple.



The two Elmore type jigs have welded-steel tanks.



Showing top of concrete sump and fresh-water sprays on buckets at right.

ing capacity is 100 tons per hour.

The original rails, 60-lb. on the front slope and 40-lb. on the back slope, were found to be in usable condition after the nineteen years of non-use and ten years of submersion. It was necessary to install new wood ties. Thirty-pound rails are used in room entries.

With the exception of the 2,300-volt back-slope hoist, all motors underground use 220 volts. Power at the higher voltage is taken into the mine by lead-sheathed cables, one in the front slope and another in a bore-hole. Banks of three 25-kva. 2,300/220-volt transformers are installed on room entries in fireproof rock-walled vaults

with iron doors on the side next to the haulage. Oil switches for these transformer stations are situated out on the back slope. Only two small pumps are used in the mine and little pumping is required. Electricity is purchased from the Alabama Power Co. Edison Type P lamps are used underground.

Elmore-type jigs which clean the 3 x 3/4-in. or 4 x 3/4-in. and 3/4 x 0-in. sizes are new, but the main shaker, loading booms and some other items are from a closed mine of the Greenville Coal Co., Bevier, Ky. Drives were modernized by application of Gates V-belts. The tipple has four loading tracks, two of which are served by

loading booms. A fly gate under the rotary dump diverts mine rock to a bin or directs the coal to a 48-in. apron conveyor delivering to the 6 x 40-ft. double-deck shaker. The plus 4-in. lump, sold usually to the domestic trade, is hand-picked on the apron boom by car trimmers.

Separation of the 4 x 0-in. fraction for two-size washing job is done on a Link-Belt vibrator. After being washed, the two sizes are remixed in a settling tank, then elevated to a wet-coal bin. Sizing of this washed coal takes place on a second Link-Belt vibrator and the washed products are 1 1/2 x 3-in. and 1 1/2 x 4-in. nut, 1 1/2 x 0-in. steam and either 3 x 0-in. or 4 x 0-in. steam.

In a Jeffrey 30 x 30-in. single-roll crusher at the end of the egg boom the plus-4-in. can be crushed for remixing with the washed coal. Ordinarily two grades of dry coal and three sizes of washed coal are loaded; however, additional sizes of washed coal can be loaded to meet special requirements of the trade. Lump coal from this mine carries 3 1/2 to 4 per cent ash and the washed 1 1/2 x 0 contains approximately 6.5 per cent ash, as compared to 13 per cent if no washing was done.

Weld Tank on Jigs

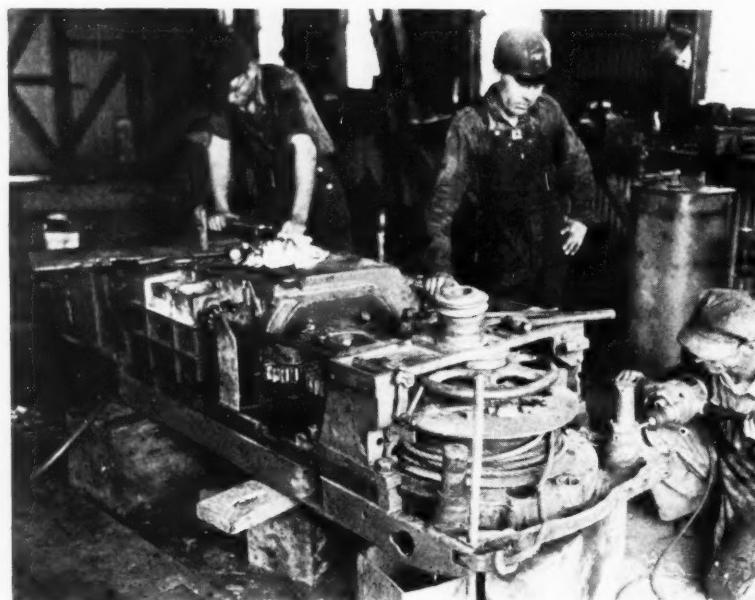
The Elmore-type jigs, which were made locally by the Caldwell Foundry & Machine Co., have welded steel tanks. The remixing and settling tank, which also serves as a sludge tank, is of concrete with the top at ground level. A slow-speed drag conveyor with flights scraping the bottom of the tank moves the washed coal to the front into the bucket elevator pit. Make-up water enters via three sets of sprays playing on the washed coal as it is elevated in perforated buckets.

The mine has 40 years or more life ahead, so an adequate set of auxiliary buildings has been erected. These include a mine office and lamphouse; electric, machine and supply house, and a blacksmith shop. Tracks serving the mine connect at Blocton with four railroads: the Mobile & Ohio, Southern, Louisville & Nashville, and Alabama Great Southern.

Local mine officials who have served during the construction and reopening of Blocton No. 9 are J. P. Upchurch, superintendent; John Samsel, mine foreman; and John Cain, chief electrician. The design and plans for the outside construction and washer were made under the direction of George Barnard, mechanical engineer, of Birmingham.



Adequate auxiliary buildings were erected for a long-life mine.



Rebuilding an a.c. machine which is to be added to the cutting equipment.

SHAFT-BOTTOM FANS

Still Hold Replacement Advantages

As Further Discussion Stresses Desirability

RECENT development of the high-pressure high-efficiency propeller-type mine fan has further emphasized the desirability of locating replacement fans at or near the air-shaft bottom at mines already equipped with a surface fan maintained in operating condition for emergency use. Satisfactory alternative methods of installing shaft-bottom propeller fans to insure motor ventilation with fresh intake air are shown in Fig. 1, while Fig. 2 depicts an actual installation. Both England and the Continent have recognized the many advantages in safety and economy offered by the system and accordingly have granted it statutory approval. Among the list of advantages too important to casually disregard are, in the author's opinion, the following:

1. Two independent means of mine ventilation instead of one.
2. The possibility of rapid scavenging following an inside explosion by simultaneous operation of surface and shaft-bottom fans in series.
3. Greater protection against damage by lightning and outside forces by virtue of shaft-bottom fan location.
4. Instant availability of surface fan virtually assured following the worst possible mine explosion.
5. Power-reduction possibilities at mines equipped with a multi-compartment airshaft with leaking curtain wall.
6. Power-reduction possibilities at mines employing major split regulations.
7. Elimination of objectionable fan noise.
8. Reduced installation costs.

The idea of installing replacement fans on the shaft bottom, at the same time retaining the original surface unit or units for standby service, has many advantages which have been demonstrated in actual service. However, objections have been raised, and these the author attempts to answer in the accompanying article.

By RAYMOND MANCHA

*Manager, Ventilation Division
Jeffrey Mfg. Co., Columbus, Ohio*

9. Installation possible without interrupting mine operation.

10. Operating and installation economies encourage improved ventilation at mines difficult to ventilate.

The principle of shaft-bottom replacement fan location was discussed in detail by the author in an article appearing in the May, 1938, issue of *Coal Age*, entitled "Propeller Fans Promote Safety and Cut Ventilating Costs When Installed on Shaft Bottom," and also in a paper entitled "Ventilation Methods and Installations," delivered at the October, 1938, meeting of the National Safety Council. For the most part, it has been favorably received by men in the American mining industry. However, some have raised conscientious objections, and in this article an attempt will be made to present satisfactory answers by stating the objections, especially as they refer to conclu-

sions in "Ventilation Methods and Installations," and then setting down the replies.

Objection—"On Page 1, paragraph 2, you say: 'I refer only to coal mines which already are equipped with a surface fan capable of ventilating the mine, which fan is kept in good repair and ready for emergency operation on a moment's notice. Regardless of the many advantages accompanying this type of installation . . . I do not feel that this type of installation should be considered at any coal mine where there is no surface fan for standby purposes.' It is apparent from the foregoing that you do not consider it a safe practice to install the mine ventilating fan or fans underground unless a reserve fan, located on the surface and capable of effectively ventilating the mine, is maintained so it can be placed in service on a moment's notice. In the case of replacement of an ineffective, inefficient surface fan it would not be practical to depend on the old surface fan for adequate mine ventilation in event the underground fan (or fans) was damaged or destroyed by an explosion, fire or fall of strata."

Answer—It is correct that the shaft-bottom fan is recommended only at mines equipped with a surface fan maintained in condition for emergency operation and capable of effectively ventilating the mine. However, by effective ventilation is meant sufficient ventilation to permit removal of men following an explosion and rehabilitation of stoppings, overcasts, etc., preparatory to reestablishing normal ventilation.

An explosion capable of wrecking a fan at the airshaft bottom would

wreck the mine sufficiently to necessitate temporary suspension of operation. Such an explosion originates at some point inby the circuit and is propagated by dust to the bottom, destroying stoppings and overcasts in its wake. Normal ventilation, therefore, is impossible, regardless of the fan capacity available, until the circuit is reestablished.

Objection—"I do not know of a condition where a new fan cannot be installed on the surface to replace an old fan at a reasonable additional cost without interrupting mine operations."

Answer—Quite frequently, the fan manufacturer is faced with the necessity of moving the existing fan to make space for the replacement fan. This requires complete shut down of the mine, which is dangerous, costly and in many cases impossible.

Objection—"To maintain the old fan in serviceable condition in the event of an emergency in all probability would require the installation of a new or larger motor, which, if done, would be because of the recognized fact that the new underground ventilating units were installed in a hazardous location."

Answer—Ordinarily, a surface fan used to furnish normal mine ventilation prior to installation of a shaft-bottom fan is amply powered and quite capable of serving as an adequate emergency unit for a long time thereafter. The emergency surface fan is maintained so that the additional advantages of the shaft-bottom fan may be realized with complete safety.

Objection—"In my opinion, your theory is based on two factors, namely: excessive curtain-wall leakage between upcast and downcast compartments of multiple-compartment shafts, and the advantages of utilizing ventilating units installed underground for each major split, effecting a power saving. Regarding curtain-wall leakage, it is a recognized fact that in shaft mines opened three or four decades ago, or prior to the adoption of reinforced-concrete shaft linings, curtain walls, etc., there was, and in timbered shafts still is, excessive leakage through curtain walls. However, at modern plants, if the airshaft is made an auxiliary to the main hoisting shaft for raising and lowering men, materials, etc., and one compartment is utilized as a fan upcast or downcast separated from the hoisting compartment by a substantial reinforced concrete curtain wall,

there will be very little, if any, leakage—certainly not enough to justify installing a propeller-type fan at the shaft bottom and, in addition, maintaining an emergency fan on the surface."

Answer—The degree to which modern brick or concrete curtain walls are found to leak air is surprising. When testing a mine fan operating at an airshaft separated from an auxiliary hoisting shaft by means of a curtain wall, it should be routine procedure to measure the air volume both at the fan and at the airshaft bottom. The results of numerous tests of this sort at mines in all parts of the country disclose that even the most modern masonry curtain wall may leak badly after a short period of weathering.

Objection—"At a two-shaft plant of this type a greater portion of the volume of air enters or leaves the mine via the main (hoisting) shaft, which of course reduces the pressure on the curtain wall below the total mine ventilating pressure."

Answer—The total mine ventilating pressure is the difference between the atmospheric pressure outside the mine and the pressure in the airshaft collar. Therefore, the pressure differential across the curtain wall at the top of the airshaft is approximately equal to the mine ventilating pressure regardless of the air volume handled by the auxiliary hoisting compartment. The curtain-wall pressure differential at the airshaft bottom differs from the top pressure differential only by an amount equal to the sum of the pressure drops in the two compartments. Therefore, the greater the percentage of the total mine air handled by the auxiliary hoisting shaft the greater will be the pressure drop therein and the less will be the curtain-wall pressure differential at the shaft bottom. It therefore follows that the effect of reducing the air volume handled by the auxiliary hoisting shaft by increasing the volume in the main hoisting shaft will be to make the curtain-wall average pressure differential more closely approach the mine ventilating pressure in value.

Objection—"The theory behind the proposal to install underground fan units to ventilate each major split is commendable from an economy viewpoint but questionable from a safety viewpoint. In event of an explosion involving serious damage to a ventilating unit in a major split, necessitating starting of the emergency surface fan to facilitate exploration, rescue and research work, in all probability including combatting, extinguishing or sealing of fires, main overcasts, stoppings, etc., would of necessity have been previously installed to facilitate ventilation by the surface fan of any of the major splits ventilated by a separate unit in event of a similar occurrence in any one of the various major splits. After the surface fan has been put into operation, regulation of some, if not all, of the unaffected major splits will be required to obtain sufficient flow of air into the explosion area."

Answer—Major splits ventilated by individual shaft-bottom fans are without major regulation. However, at the time of discontinuing operation of the surface fan this fan was powered to ventilate the mine with all major splits regulated, excepting the free split. Therefore, emergency operation of the surface fan would produce greater than normal ventilation of all major splits except the free split, provided, of course, that the circuits remain intact.

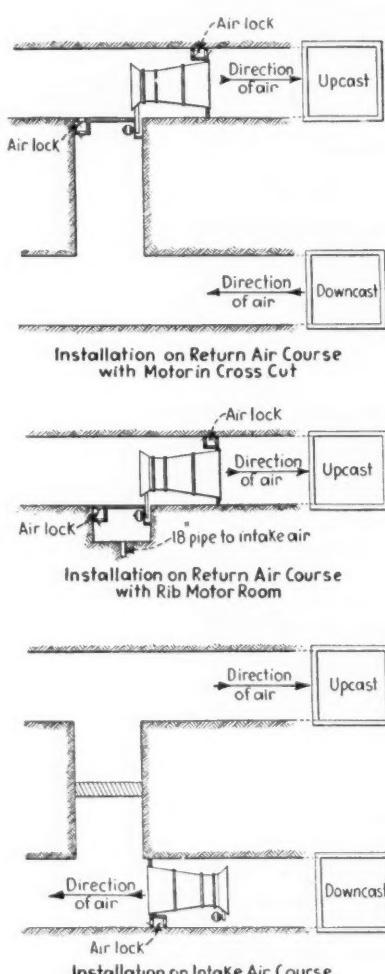


Fig. 1—Alternative methods of installing propeller fans underground.

Objection—"The possibility of this would be contingent upon the return airway from the explosion area not being blocked with the débris of the demolished fan previously utilized for ventilating the explosion area. In the event the return airway is blocked, considerable time would be consumed in removing the débris to facilitate resumption of the ventilating air current. And, under the circumstances, self-contained oxygen breathing apparatus might have to be used. This might mean life or death to many of the men in the explosion area."

Answer—A squad of men with acetylene torches would find it difficult to block an aircourse with the quantity and kind of material used in the construction of a propeller fan. Therefore, the likelihood of this being accomplished by the sweeping force of an explosion is too remote for practical consideration.

Objection—"In all probability, due to the interruption of ventilation in the explosion area, the ventilating units in the other major splits, assuming that they are functioning as an exhaust system, may draw poisonous gases from the explosion area and conduct them into the unaffected portions of the mine. However, in the event of an explosion in the same major split area ventilated by a surface fan, assuming the surface fan is not seriously damaged and continues to function, at least a part of the explosion area will receive a large volume of air immediately after the explosion due to dislodged stoppings between intake and return airways decreasing the resistance of the split and increasing the volume, this air also conveying after-damp and poisonous gases encountered through return airways to the surface and preventing it from contaminating fresh air entering other major splits."

Answer—Following a local explosion occurring in the circuit without damage to the shaft-bottom fans, gases from the explosion area will be disposed of in the same manner as if the mine were ventilated with a surface fan. If the force of the explosion at the shaft bottom was sufficient to wreck one or more of the shaft-bottom fans the mine would be wrecked and therefore the surface fan should be placed in immediate operation and rescue work begun. In any event, the shaft-bottom fan system would insure availability of the surface fan for rescue work following an explosion that otherwise might wreck the surface fan with resulting

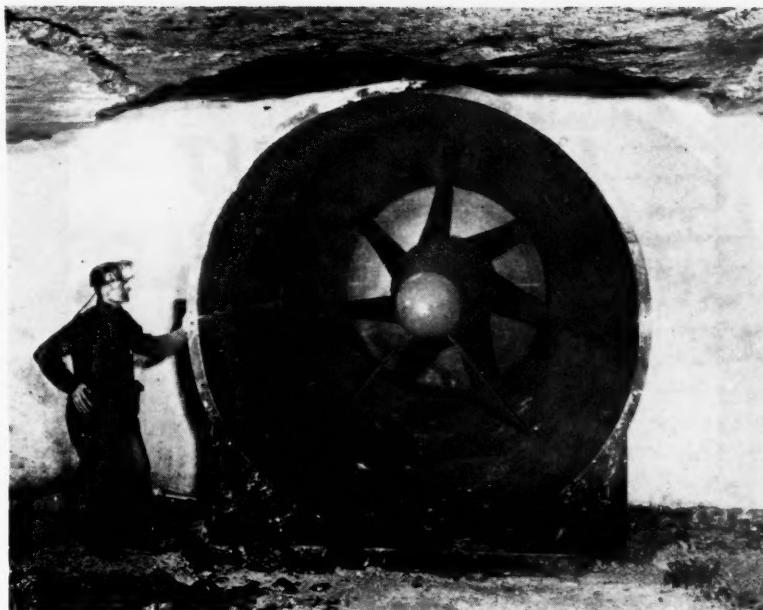


Fig. 2—Propeller fan in service on shaft bottom, from discharge side.

loss of lives. The uncertainty of explosion-door fan protection is universally recognized.

Objection—"In event of disability to one of the major ventilating units, particularly in a gaseous mine, the entire mine would be idle."

Answer—In the event of failure or disability of a shaft-bottom fan on a major split, starting the surface emergency fan and leaving the remaining shaft-bottom fans operating would result in the idle-fan split receiving ample ventilation for scavenging purposes and it could be shut down and the remaining major splits worked. After all, the ventilation on the remaining splits would be increased above normal due to operating the fans in series.

Objection—"Again referring to your claim of promotion of safety and security of property by the installation of propeller-type fans on shaft bottoms, let me quote: 'The lower power requirements of the shaft-bottom fan will encourage the mine operator to increase the air volume ventilating his mine, since a ventilation increase is possible for the same power previously required by the surface fan. Such encouragement is a step in the direction of greater safety and should meet with the approval of all men interested in safety first.' These sentences indicate that the mine or mines are not in a safe, healthy condition due to inadequate volumes of fresh air properly distributed and that therefore, as an inducement to the operator or operators to provide adequate volumes of

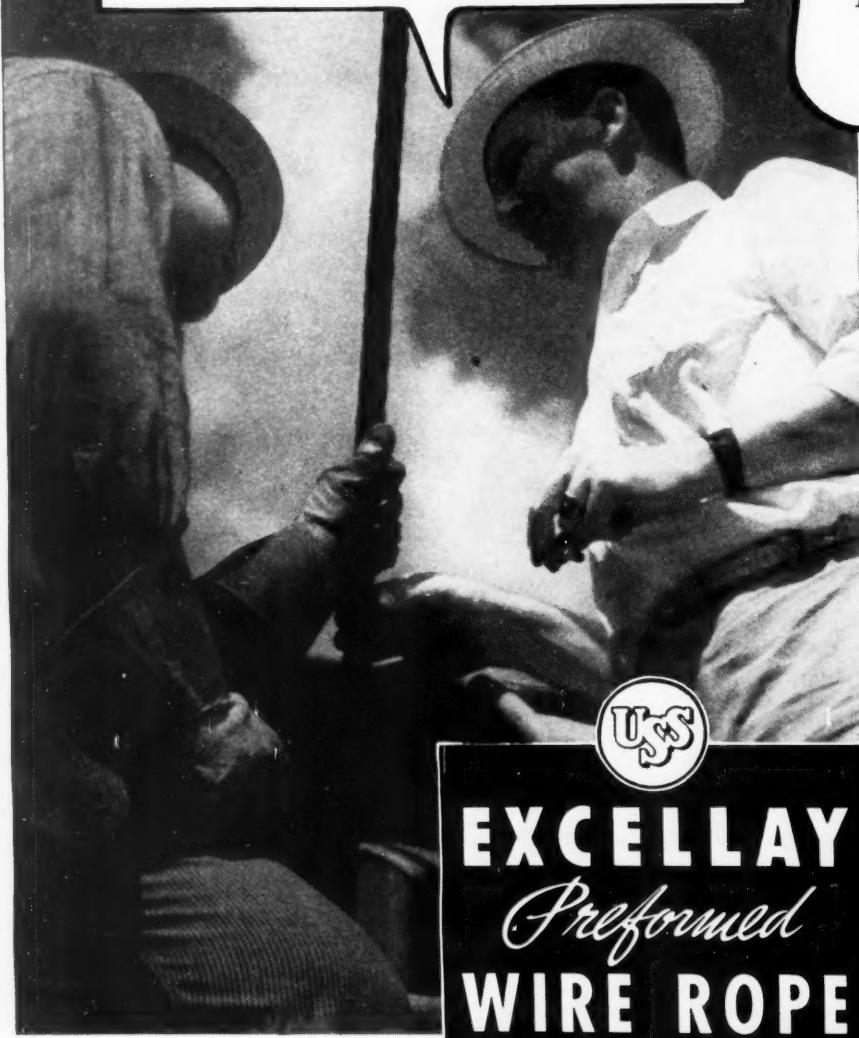
air, fans should be installed on the shaft bottom because of decreased power costs. In my opinion, safety in actual practice is effected by safe installation and maintenance of safe conditions, practices and methods which, when effected, constitute efficient management."

Answer—Quite frequently, State mine inspectors are faced with borderline decisions. Changes in mining methods, greater than initially anticipated development, unforeseen adverse natural conditions, etc., are a few of many reasons why an old mine can become hard pressed to maintain strictly adequate ventilation.

Objection—"In your paper you attempt to justify your theory in the interests of safety, but invariably revert to economy. The first sentence of the last paragraph on Page 8 of your paper includes the statement that 'An additional safety feature of the shaft-bottom propeller fan results from merits already discussed, such as reduced power, quietness of operation and economy and ease of operation.'

Answer—Whenever "safety" and "economy" are complementary those interested in safety should take advantage of the fact. One of the outstanding deterrents to any safety program is "cost," which is well recognized by those actively engaged in safety promotion. Therefore, the occasional occurrence of a program or device combining both safety and economy should be heralded with enthusiasm as a safety pill with sugar coating.

LOOK OUT FOR TROUBLE THIS ROPE'S AS DRY AS A BONE!



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Preformed
WIRE ROPE

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

For Anthracite Service: Miners Bank Building, Wilkes-Barre, Pa.

COLUMBIA STEEL COMPANY

San Francisco

United States Steel Export Company, New York

UNITED STATES STEEL

FROM THE DAILY REPORT OF A
TIGER BRAND WIRE ROPE ENGINEER

Was out on a job with Mr. Long this AM when I came across a wire rope that was badly in need of lubrication. "Look out for trouble here," I told him, "this rope's as dry as a bone."

He looked it over. "Looks okay to me," he said, "not much wear."

"That's just the point," I told him. "You can't see what goes on inside a rope. When it's not lubricated, the external appearance may deceive you. The inside wires may be badly worn and corroded and even broken from abrasion and binding."

"Better give that rope a good dose of lubricant if you want to save it."

Yours,

Al

BY keeping your wire ropes properly lubricated, you save money two ways: You protect the rope from premature failure; and you reduce friction.

Proper lubrication is an effective deterrent to corrosion. It protects both inside and outside wires against destructive rusting. It keeps all wires free to slide over each other, as they must do when the rope bends over sheaves and drums. It minimizes friction and wear between individual wires, and between the rope and sheaves or guides through which it passes. It is the safest, surest method of preventing excessive wear inside the rope, where you can't see it.

See that all wire ropes are properly lubricated at regular intervals. Insure greater safety—prolong rope life—reduce lost time—get the benefits of fewer replacements. For specific recommendations on wire rope lubricants and lubrication practice, see the Tiger Brand Wire Rope Engineer who contacts you.



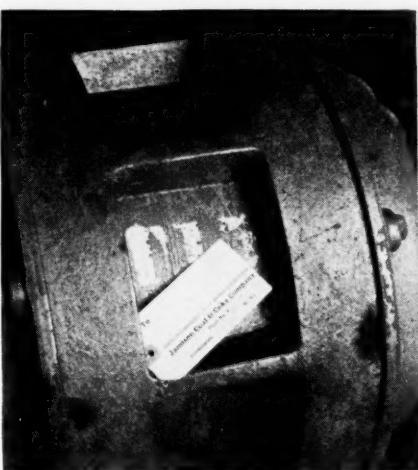
WHAT'S NEW

IN OPERATING IDEAS

Only Engineer Can Open Surface Shaft Gates

Surface gates at a coal-hoisting shaft arranged so that only the hoisting engineer can open them long have been recognized as a step toward safety. Next came signal lamps and interlocks and limit switches to forestall possible error in operation. Completely automatic is the gate equipment and control now used at the coal shaft at Federal No. 1 mine, Koppers Coal Co., Grant Town, W. Va.

The gates are opened and closed by compressed air and the valves controlling the air cylinders are operated by a nut traveling on a thread bar which is chain-driven from the hoist shaft. By restricted air passages in a pilot valve, a definite timing element is built into the device so that when a cage moves by its landing the main operating valve does not have time to act. When the



Oil changes are recorded on an attached tag.

The illustration shows a lubrication tag attached to a 50-hp. 220-volt squirrel-cage motor in the tipple. An ordinary shipping tag is used and on it is the legend "Oil changed, crusher motor, July 28, 1939." Since the motor is in a dry place, the writing will remain legible at least until the next oil change, when a new tag will be applied.

Surface Communication Aided By Loud-Speaker System

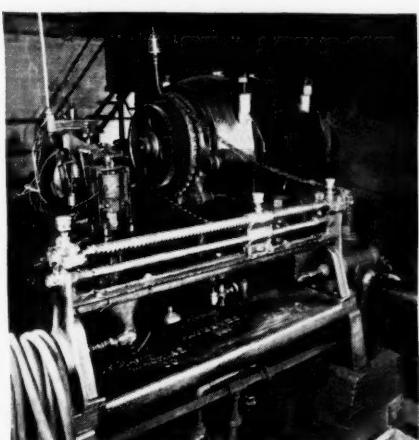
Communication around the top works at Federal No. 1 mine, Koppers Coal Co., Grant Town, W. Va., has been improved by the installation of a private loudspeaker system. The equipment connects the division superintendent's office with five other supervisory offices around the plant. It also can be used for addressing a group, or several groups, of men, such as on safety by the safety director.

A demonstration of the system from the mine shop is shown in the accompanying illustration. The division electrician is holding in a switch on the control box which selects the desired station. The small box next above is the public-address switch and above that is the transformer. The transmitter for the station is an ordinary telephone audio unit and the loud speaker is mounted on the wall. In the division superintendent's office, speaker and transmitter are in a case which stands on the desk. Distances between stations are but a few hundred feet. Equipment is rented from the Bell Telephone Co.

Marking Amperage on Dial Aids in Slope Hoisting

To enable the hoisting engineer, where electric hoists are used on slopes, to determine when the hoist is pulling too hard as a result of derailed cars or other trouble, Charles W. Watkins, Kingston, Pa., an ex-hoist operator, suggests adding markings covering the peak or average amperage for different sections of a slope to the indicator dial. Thus, in cases where the grades vary on different sections of a slope, the engineer has directly on the indicator dial the amperage the hoist should pull on each section and can govern his actions accordingly.

The amperage markings, Mr. Watkins suggests, may be placed on the dial by chalking

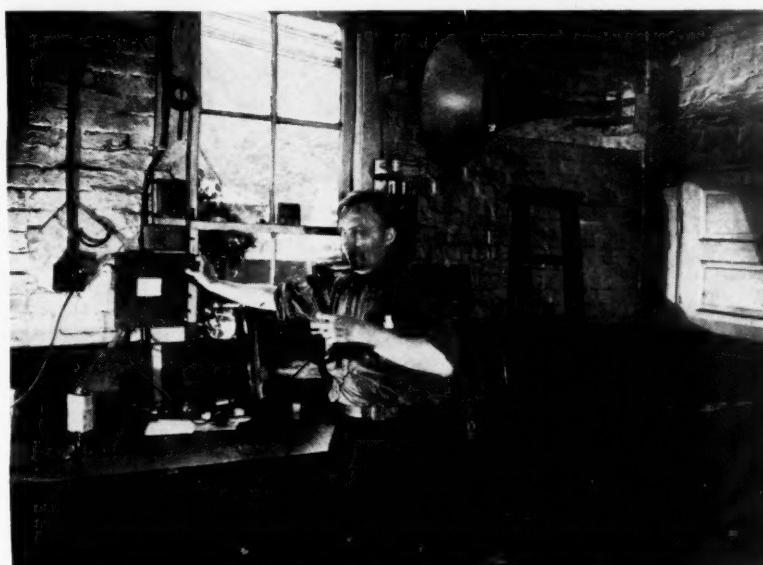


Opens and closes the gates automatically if the cage is stopped at a landing.

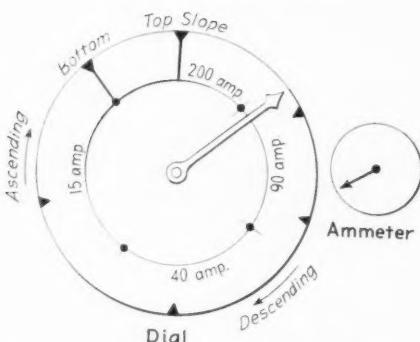
cage is stopped at a landing, however, the action takes place and the respective gate opens automatically. As soon as the cage is moved from the landing, the gate closes. The air-control equipment was supplied by Osborn Machine Co., DuBois, Pa.

Tags on Electric Motors Show Oil-Change Dates

Records are an excellent aid in maintenance and often it is a maintenance problem to devise a way of keeping a record of a specific job without complicated clerical work. The direct method of attaching the record to the equipment itself is satisfactory on certain types. As an example, oil changes on stationary motors at Jamison No. 8 mine, Jamison Coal & Coke Co., Farmington, W. Va., are recorded by tagging the individual motors.



Electric-shop station of the loud-speaking system.



Amperage figures are marked on the inner circle on the indicator dial.

or painting on the dial a circle with cross marks to indicate the various grade sections. Then, the amperage for each section may be lettered in on that part of the circle. In the accompanying illustration, these amperages, as an example, are set at 15, 40, 90 and 200. By glancing at the ammeter, the engineer then is able to check what his hoist is pulling and thus determine whether the load is normal or whether it is higher, signifying a car off the track or other difficulty. Thus it is possible to stop the hoist and rectify the trouble before too much damage is done.

In connection with this suggestion, Mr. Watkins points out that frequently ammeters, tally boards and other instruments or indicating devices are placed so that the engineer must turn his head to look at them, with the result that his mind is more or less distracted for the moment. Therefore, Mr. Watkins recommends that all such equipment be installed so that turning of the head is eliminated.

Guards Added to Conveyor Aid Loader Operation

Guards added to the rear conveyor have reduced delays and cut maintenance on Joy 7BU loaders at the Continental No. 4 mine of the Continental Coal Co., Cassville, W. Va. The two guards on one side are shown in the accompanying illustration. The one

to the left protects the threads of the adjusting screw for the conveyor chain and is held in place by the same 3-in. bolt that fastens the adjusting-screw clamp. Formerly, the threads of these screws sometimes were damaged by bumping against the steel cars. At the right is the guard which has been placed over the sheave and plunger of the hydraulic swing jack. This also eliminates a former difficulty arising out of bumping cars. The piston became scarred, in turn damaging the packing and causing oil leaks.

Soil-Heating Cable Used To Melt Spout Ice

Freezing of down-spouts and gutters in the winter were licked at the Boney Falls plant of the Escanaba Power Co. by installing 125 ft. of soil-heating cable (of the type ordinarily used in hothouses) in the 65-ft. down-spout and along that portion of the gutter most seriously affected by freezing, writes Paul C. Ziemke, Milwaukee, Wis. The cable, with a current capacity of 800 watts, is connected to the building mains through a thermostatically operated switch, which in turn operates a solenoid-type switch with thermal-overload links. The thermostat is adjusted to function between temperature settings of 32 and 36 deg. F. After two seasons of service, the system still is working efficiently, Mr. Ziemke states.

Splicing Conveyor Belts Aided By Proper Choice of Methods

"Practically all conveyor belts can be successfully joined by means of metal fasteners, and there are several good conveyor-belt fasteners on the market," says Michael Berman, technical superintendent, Hewitt Rubber Corporation. "For light- and medium-duty conveyors, the 'staple' fastener gives very good results. This type is very easily applied and requires no special tools. For heavy-duty, high-tension conveyors the double-plate fastener should be used. The plates compress the belt and anchorage thereby is materially increased. This fast-

Three B's Plus F

Again another season of birds, bees, flowers and baseball rolls around. And, like the unvarying seasons, the major objective in coal mining still remains the lowest possible cost, meaning, in turn, the maximum efficiency. But efficiency is a matter of little things as well as big. That is the reason for the Coal Age Operating Ideas section, which is designed to pass on the cost-cutting efficiency-promoting ideas of operating, electrical, mechanical and safety men. So send yours in, along with a sketch or photo if it will help to make it clearer. Acceptable ideas are paid for at the rate of \$5 or more each on publication.

ener should be used wherever there is a severe reverse bend due to tandem or tripper pulleys. The shallow plates become embedded in the covers and the center pull is along the neutral axis of the belt.

"Care should be used in cutting the ends of the belt square. If belt holes are required, these should be carefully punched so the fasteners will pull uniformly over with the width and the various piles. Uneven strains due to improperly applied fasteners may result in ply separation or belt injury. The fasteners should be inspected regularly and renewed at the first indication of weakness.

"If the conveyor handles corrosive material which would deteriorate the cotton fabric, we recommend coating the cut ends of the belt and the belt holes with rubber cement and using special corrosion-resisting fasteners. If corrosive conditions are excessive, and conditions permit, the belt should be made endless in the factory or through use of a field vulcanizer, as described below.

"A number of large operators of conveyors have experienced economy in making belts endless with these portable electric vulcanizers. In certain high-lift installations where the tensions are extremely high, an endless belt is almost essential. The vulcanized splices are stronger and have the advantage of smoother traction when traveling over the pulleys. Since most installations require occasional repairs and reslicing during the life of the belt, the possession of a vulcanizer and a crew trained to make splices is desirable. Since most installations require occasional repairs and reslicing during the life of the belt, the possession of a vulcanizer and a crew trained to make splices is desirable. Before making a long center conveyor belt endless in the field it usually is good practice first to operate the belt temporarily with fasteners. This reduces the likelihood of the belt stretching beyond the limits of the take-up and necessitating a new splice.

Verbal Orders Prohibited To Prevent Errors

Literally taking a leaf from the book of an equipment manufacturer, the Dawson Coal Co., Clarksburg, W. Va., practically put a stop to tipple errors which before



Guarded to take the bumps against the heavy steel cars.

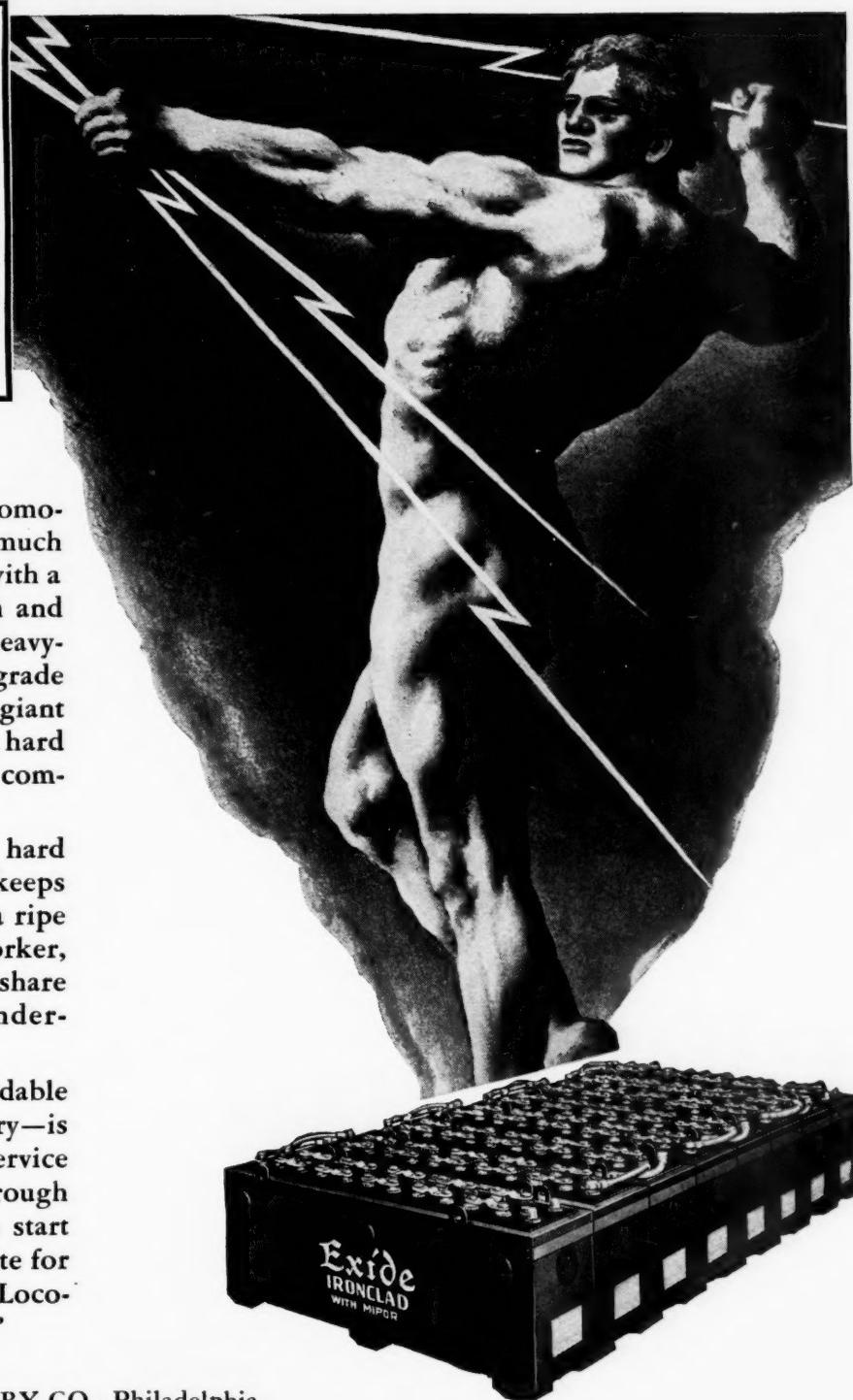
The giant that lives in a box...

AN EXIDE-IRONCLAD locomotive or trammer battery looks very much like a black box . . . but it is a box with a giant inside it. A giant of strength and endurance, who can take a train of heavily-laden cars and push them up a grade while scarcely exerting himself. A giant who can start in the morning, work hard and fast all day, and end up just comfortably tired.

He is a durable giant, used to hard knocks and rough usage. And he keeps the full strength of youth far into a ripe old age. He is a willing, faithful worker, and he does, in fact, perform a large share of the nation's haulage work underground.

This giant—the tireless, dependable power of an Exide-Ironclad Battery—is waiting to speed up your haulage service and production. He is confident through long experience . . . and eager to start work for you, beginning now. Write for free booklet, "The Storage Battery Locomotive for Underground Haulage."

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 DALLAS—1118 Jackson St.
 DENVER—810-14th St.
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 PHILADELPHIA—Allegheny Ave. and 19th St.
 PITTSBURGH—1078 Union Trust Bldg.
 ST. LOUIS—1218 Olive St.
 SAN FRANCISCO—6150 Third St.
 SEATTLE—1919 Smith Tower Bldg.
 WASHINGTON—1619 L Street, N.W.

AVOID VERBAL ORDERS

TO Shipments - July 19-1939 **DATE** July 18-1939
 SUBJECT

2 - Gondolas	- 5" Block	- Jones & L. - 11876
1 - Gondola	- 1 1/4" Peat & S.	- Hartley & L. - 10186
2 - 50 Ton Hops	- 3" Slack	- Cary & C. - 11143
1 - 70 Ton Hop	- 3 1/4" Slack	- B.L. Call - 12973
4 - 50 Ton Hops	- Mine Run	- J.B. Conroy - 11540
10 - 70 Ton Hops	- 3" Lamp	- A.P. Paul RR - 11244
8 - 50 Ton Hops	- 3/4" X 2" Nut	- C.Y.P. RR - 10195

INSTRUCTIONS—Send Original and Duplicate to party addressed.
 Retain TriPLICATE or FOLLOW UP.
 INDIVIDUAL to whom note is addressed should make reply on Original
 Keeping Duplicate or memorandum.

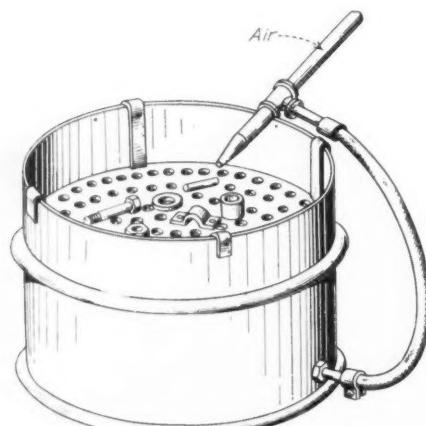
J.W.B.

Written orders to the tipple boss save time and leave no room for alibis.

it had been difficult to trace to a particular party and thus eliminate. The tipple order shown in the accompanying illustration, except for fictitious names of consignees, is typical of the way instructions now are transmitted from the mine office. Original, duplicate and triplicate copies are made on white, yellow and pink sheets, which are purchased in properly stacked pads. The coal company got the idea from the Fairmont Machinery Co. and purchases pads made up exactly the same way from the same printer.

Cleaning Small Parts Eased By Handy Shop Outfit

"There is a big advantage in being able to clean the parts from an overhauling job right at the scene of the work," writes Charles H. Willey, Penacook, N. H. "This we do nicely with the outfit shown in the illustration, which was made by cutting down a 55-gal. oil drum and fitting it with a removable perforated shelf. The shelf holds the parts to be cleaned. The cleaning fluid, or mixture, is drawn from the bottom through a strainer and, by means of a siphon operated from the shop compressed-air line, is sprayed forcefully through the nozzle, as shown. With this portable outfit, much time and labor is saved."



The spray is directed on the parts resting on the perforated plate.

and sometimes will serve in regular operation as a means of saving time and steps for the snapper. A 13-ton locomotive at the Rosedale mine of the Rosedale Coal Co., Middletown, W. Va., is equipped with such a device. As indicated in the sketch, a deep-grooved sheave is mounted on the bumper above the pin with a rope running back to an anchorage in the cab. Normally, the rope lies slack on the top of the locomotive.

Spent Rupturing Disks Make Bolts Tight

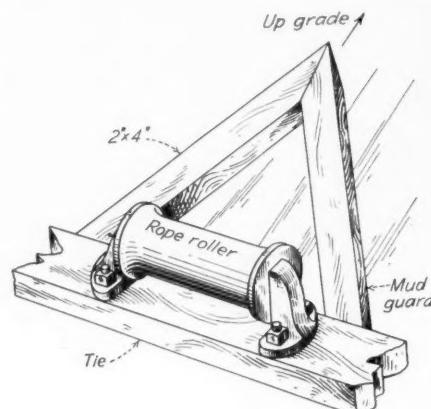
When connecting conveyor pans, writes Lloyd G. Fitzgerald, Diablock, Ky., it often is found that the bolt threads have become worn so that it is not possible to screw the nut up tight enough for a good connection.



The ring fills the gap to make the connection tight.

Mud Guard Protects Incline Rollers

To protect incline rollers, the guard shown in the accompanying illustration is used at the Devonia (Tenn.) mine of the Moore



Showing installation of mud guard to protect incline rollers.

Coal Co., reports H. A. Evans, Clinchmore, Tenn. It was installed by G. E. Moore, general superintendent, and is made of 2x4's.

Locomotive Pin Pulled From Operator's Seat

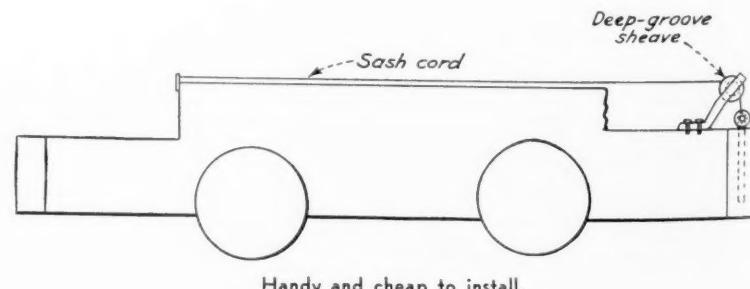
An arrangement whereby a motorman can pull the coupling pin on the opposite end of the locomotive without leaving his cab comes in handy in special switching

But if Cardox is employed for breaking down the coal, the ring part of the rupturing disk left after the cartridges are fired may be used to fill the gap, as shown in the accompanying illustration.

Extra Fuses Carried In Drill Handle

Drillers in the Rosedale mine of the Rosedale Coal Co., Middletown, W. Va., had difficulty in finding a good place to keep extra fuses for both the drill itself and for the Ohio Brass nip at the end of the cable. The chief electrician and master mechanic solved that one by fitting the hollow drill handle to hold the fuses.

The end of the handle is tapped to take





CONFUCIUS SAY:
"Wise Coal Operator go to
MORROW for EQUIPMENT

today!"

**Everything from a Simple Replacement
to a Complete Coal Tipple**

Wise, indeed, is the operator who depends on Morrow for his tipple replacements. He gets not only quick replacement service for every operating emergency but also the money saving suggestions of engineers who have specialized in coal tipple equipment design and operation exclusively for many years.

That's why you will always find it profitable to talk to a Morrow engineer. He knows coal tipple equipment from blueprint to finished product . . . he's familiar with the latest developments in screens and picking tables, hoppers and conveyors and can offer you valuable advice that will save you needless trouble and expense.

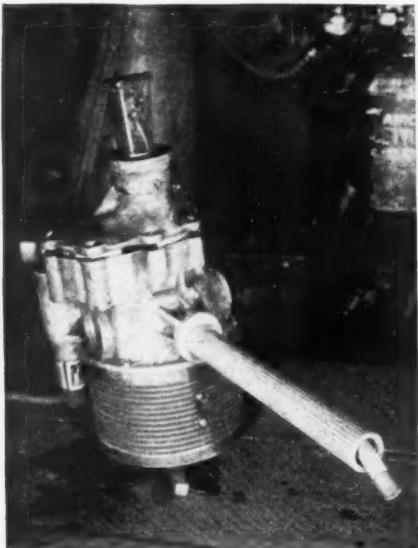
Remember MORROW for everything from a simple replacement to a complete tipple

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MANUFACTURING CO.

WELLSTON, OHIO

DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 25 YEARS



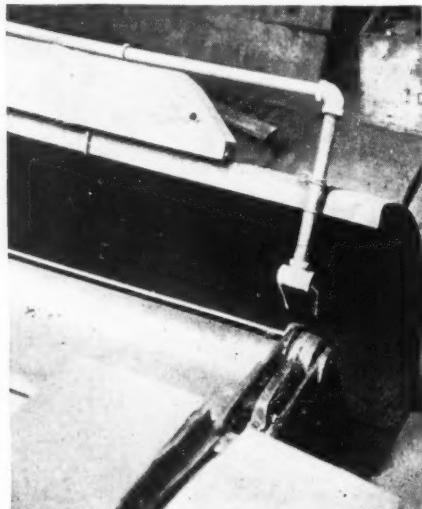
Extra fuses are carried in the drill handle.

a 1-in. plug, eight threads per inch. The plugs, made on the shop lathe, have a shoulder for a gasket and a slot across the top to take a screw driver in case they become too tight to loosen by hand. The gasket is necessary because the end of the handle often is rested on the mine bottom, where mud and water may be present. Now, in case of a blown fuse, the driller loses no time in getting a new one.

Conveyor Rollers Lubricated By Simple Dripper

Several mines in northern West Virginia lubricate the rollers of tipple conveyors by the simple method shown in the accompanying illustration—made at the Dawson No. 2 plant of the Dawson Coal Co., Clarksburg. The distributor consists of a 1-in. tee with a loop of No. 4 copper wire hanging in it. The ends of the wire are bent so that they hang with the correct spacing for dropping oil on the shaft at each end of the roller.

The piping system is connected to an elevated tank. At Dawson, the practice is

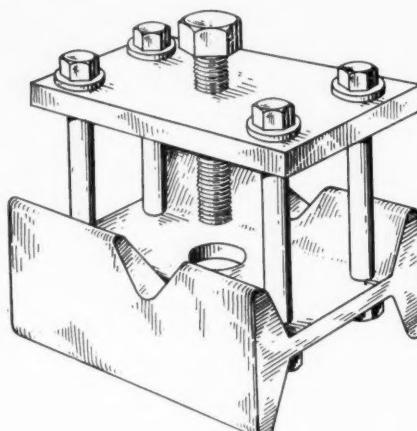


Lubricator at drive end of lump-table conveyor.

to open the tank valve only a few minutes a day and let the oil drop very fast—practically a fine stream. Another practice in the district is to adjust the valve to a very slow feed and leave it open most of the shift.

Small Heavy-Duty Bench Press Easily Made in the Shop

"Here is a design for a small bench press that can be made quite easily from a section of steel I-beam, a few large bolts and a steel plate," says Charles H. Willey, Penacook, N. H. "While the illustration conveys all the construction details, it might be well to say a few words about its use. The V-

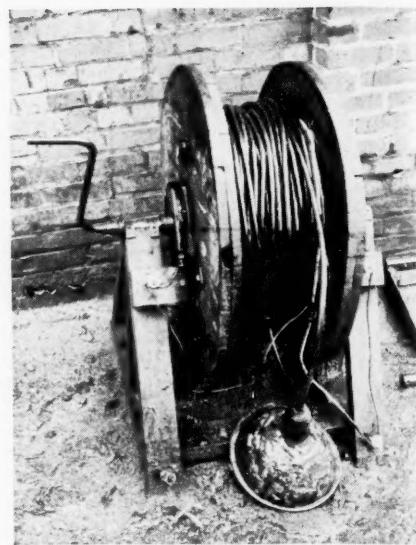


Bench-press details.

slots receive shafts for straightening. The hole below the screw is used to force out bushings or pins. Straightening bars or flats is done lengthwise in the press by the use of small flat blocks properly placed."

Extension-Cord Reel Eases Handling

Long extension cords are tedious to handle, and in larger sizes and extreme lengths the weight adds to the difficulties. The answers to these problems are in



Plug power into the reel and a handy shaft light immediately is available.

corporated in a reel used for shaft inspection and maintenance at the Federal No. 1 mine, Koppers Coal Co., Grant Town, W. Va. It will be recognized from the accompanying illustration that a wooden shipping reel was pressed into service. Crank and fixed shaft were added and a slip ring with stationary finger was mounted on each side. Shaft depth is 255 ft. and the reel is equipped with 300 ft. of No. 14 rubber-sheath cord. Inside the reflector is a cluster of five sockets.

Shop-Order Safety Messages Reduce Accidents

"Accident records for a medium-sized coal-mining operation revealed a high accident-frequency rate without any lost time for maintenance employees in the central shop and a low accident frequency rate with considerable lost time for production employees," writes K. N. Banthin, mining engineer, Oak Park, Ill. "Investigation of production accidents revealed a multiplicity of causes all of which could have been eliminated under

SHOP ORDER	
FORMAN Joe Downs	DATE 11-24-39 CODE E-21-3
Make up set of brake shoes for the #3 haulage motor. Use castings #5-179X and grind to 2 3/8" width.	
USE GOGGLES	
SHOP ORDER	
FORMAN Joe Downs	DATE 11-29-39 CODE E-27-3
Install new cells in *7 and *9 positions of battery #4 - spare battery for #3 haulage motor.	
USE GOGGLES	CAUTION BE CAREFUL
A.R.	COMPLETED BY DATE

Showing how appropriate safety directions are stamped on shop orders.



The machine that can let out its belt when it eats too much

A typical example of Goodrich development in rubber

THRESHING day on the farm used to be a time of back-breaking work, lung-filling dust, mountainous meals for the farmer's wife to cook. Engineers developed a machine that would do away with all this—it would thresh grain automatically as it was cut.

But there was a snag in it—literally. Moving through the fields, this combine, as it is called, ate up the grain but it also gulped down rocks, sticks, heavy wads of grain and weeds. Trying to force these past the threshing cylinder, the chain drive would break.

Belts of all kinds were tried but they

broke, too, or were stretched beyond usefulness. Then Goodrich belt engineers went to work. All cords in belts had always been straight. Goodrich developed a way to twist the cords in groups like a spiral spring. Then, when strain was put on the belt, the cords unwound enough to take up the shock, but when strain was removed, the cord "spring" snapped back into place and the belt was as good as ever.

With these belts to absorb the shock of obstructions and instantly spring back to operating tension, the new

work-saving combine becomes a practical farm tool.

Another proof of the fact that nothing is standard or static to Goodrich engineers. Next time anyone tells you all belts (or hose or any items of rubber) are alike, find out what Goodrich has been doing lately to improve that "standard" product. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio.

Goodrich
ALL products problems IN RUBBER

(Another story of Goodrich development appears on page 1)

proper existing regulations covering safety.

"Investigation of maintenance accidents revealed a marked willingness by employees to seek "first aid" after they had had minor accidents due to disregard of existing safety regulations. The nature of their work appeared to account for the frequency of the accidents and their willingness to seek immediate "first aid" for their no-lost-time record. After a general tightening up of the safety program it was decided to try to bring safety considerations closer home to the maintenance crews. As all of these men worked on shop orders received from the superintendent and mine foreman, the order forms appeared to offer a method of carrying the story direct to their jobs.

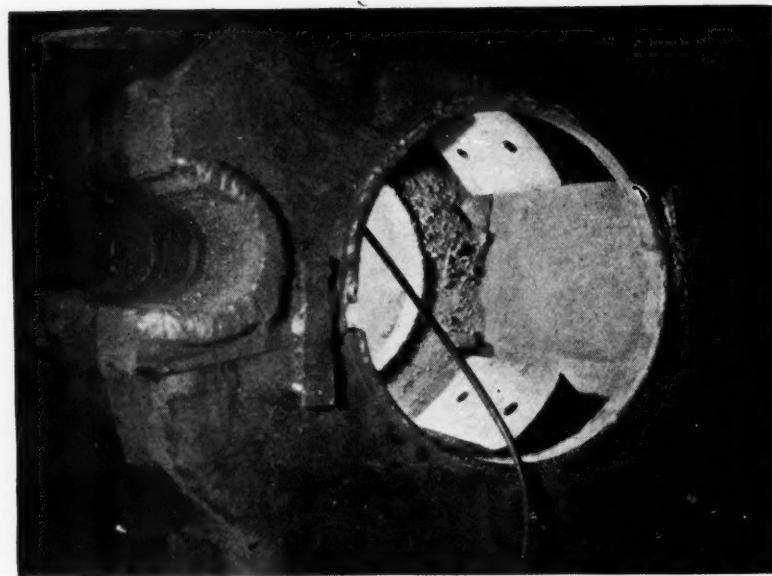
"Two orders carrying safety stamps for the employees' special attention as he starts the job are shown in the accompanying illustration. As all orders are routed through the clerk, he has an opportunity to read them and stamp them with one or both of the two stamps applicable to the work. It will be noted that one order calls for grinding down a casting and therefore the employee is cautioned to "use goggles." As the other order involves danger from acid and heavy parts, the employee is directed to "use goggles" and "be careful".

"Since stamping orders in this manner was inaugurated a decrease has been noted in the frequency of maintenance accidents. To further caution employees the foreman at times will write across the order in red pencil such statements as 'Don't try to lift this with a bar; use a jack'."

Welding Distortion Prevented By Clamping and Peening

"To prevent distortion when arc-welding motor cases, have you tried putting braces across the inside before welding and then peening the welds until the brace loosens?" That question put to C. R. Heermans, superintendent, Mount Hope (W. Va.) shops of the New River Co., got this reply: "No, but we'll try it, and when you drop by again I'll tell you how it worked." Recently it was learned that the inquiry did not result in introduction of the brace-and-peen method into the shop, but, according to Mr. Heermans, the experiments did lead to a radical change in practice. Instead of letting cases warp and then straightening them in a wheel press, a practice which had been followed for several years (*Coal Age*, p. 88, May, 1938), the cases now are being welded by a technique which prevents warping.

With the case halves separated, a layer is welded to the inside shoulder only of the rings accommodating the bearing housings. Immediately upon completion of this preliminary welding and before appreciable cooling takes place, the halves are assembled and fastened together by four straps arc-welded to the case. Next a layer is applied to the outside shoulder of each ring. The third operation is to build up the bearing surface of the rings, which is done 3 in. at a time, and each section peened. After completion of the remainder of the welding, which usually consists of filling the bolt holes and building up the axle fits, the case is allowed to cool completely before the straps are cut with a gas torch.



Motor case held together by welded strap and ready for welding and peening the bearing surface of the rings, the last operation.

During the experiments, one motor case was allowed to cool overnight after welding the layers on the inside shoulders. The next morning when the two halves of the case were to be clamped together, a definite warping was noted. As a result of that difficulty the next step was to try to weld these inside shoulders with the halves assembled and clamped, but this necessitated reaching down through the case and proved rather difficult. Welding the inside shoulders with halves separated, clamping before cooling and then proceeding as outlined in the second paragraph is now considered the most satisfactory method tried to date.

Arc-Welding Fumes and Dust Removed by Suction Fan

To remove the fumes from arc-welding, an exhaust system has been installed in a building housing the brass foundry, blacksmithing, pattern-making and welding departments of the New River Co.'s shop at Mount Hope, W. Va. This exhaust system, a refinement lacking in most coal-company welding shops, was added recently as a last touch in a modernization of the central shops (*Coal Age*, May, 1938, p. 63).

In each of five welding booths a swinging telescopic exhaust pipe hangs down in the center from an overhead duct. When the end is positioned within 4 to 6 in. of the arc, a large percentage of the fumes and dust particles is sucked into the pipe. Although the suction fan is designed to pull the fumes from the five booths at once, valves in each booth are used for closing off any pipes not in use, thus increasing the suction in the pipes serving other booths.

Drop pipes are 5 in. in diameter and the factory-made ball-and-socket joints used in each were furnished by the Barger Roofing Co., Beckley, W. Va., which installed the ducts. Main pipe size is 10 in. from blower to first booth, then is reduced to 8, 7, and 5 in. Except for the sheet-metal casing, the blower was made in the shop. It is driven by a direct-connected 5-hp. motor. Use of the system resulted in a striking reduction in dust

settling in the building and provided greater comfort for the operatives. Besides pulling fumes from the air, the system has the hot-weather advantage of cooling the booth by promoting circulation and taking out the arc-heated air. Coated electrodes now in general use are reported to throw considerably more dust into the atmosphere than the old-type bare electrodes.



On many jobs the pipe can be within a few inches of the arc.



Overhead at the far end is the suction fan serving the booths.

WHAT'S NEW

IN THE FIELD

New Electric Plant to Use Coal Though Near Water Power

Hailed as a triumph in the efficient use of coal, the new Oswego plant of the Central New York Power Corporation chose to use coal to produce electricity for an area close to water power. At full load only 0.85 lb. of coal will be required to produce 1 kw.-hr. of electric energy, contrasted with 3.3 lb. twenty years ago. Located on the Lake Ontario waterfront, the first 80,000-kw. unit of the plant will be in operation in August, a second similar unit being scheduled for operation some time next year. Designs provide for expansion of the plant to 400,000 kw. if needed.

The two units are to consume 1,600 tons of pulverized bituminous coal per day. This will mean a substantial percentage increase in the quantity of power produced by the company from fuel. During 1938, a typical year, fuel accounted for 571,000,000 kw.-hr., against 5,668,000,000 kw.-hr. produced hydroelectrically.

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St. Louis Smoke Ordinance Becomes a Law

Restoring the smoke-elimination ordinance to its original form, the Board of Aldermen of St. Louis, Mo., by the overwhelming vote of 28 to 1 on April 8 struck from the bill the controversial amendment favoring the Terminal Railroad Association. Meeting in special session, the aldermen in half an hour voted to reconsider the ordinance, which was passed April 5, and then repassed it with the disputed amendment eliminated. Later in the day, the Mayor signed the measure. Carrying an emergency clause, it became effective when signed.

Opponents of the Terminal amendment, introduced from the floor on April 5 and approved at that time by a vote of 21 to 7, declared it would permit railroads to escape the regulations that would be imposed on other fuel users.

Briefly, the ordinance requires the use either of smokeless fuels or mechanical firing equipment which will burn fuel smokelessly. The city is empowered to purchase smokeless fuel in wholesale lots and distribute it to consumers if an adequate supply cannot be provided by the usual channels of trade.

James L. Ford Jr., chairman of the Smoke Elimination Committee, announced that plans are under way to supply St. Louis with 500,000 tons or more of high-grade Arkansas coal to assure a sufficient supply of smokeless fuel for the city next winter. This coal would be delivered to the city gates for about \$4 a ton and would retail for about \$5.50 a ton, which is somewhat less

than the price for high-grade Illinois coal. Vital to the plan to bring Arkansas coal to the Mound City is a reduction in freight rates. To this end, said Mr. Ford, the Frisco Ry. has applied to the Interstate Commerce Commission for a reduction in rates on train-load lots. If the Frisco petition is granted, the shipping price from Fort Smith, Ark., will be \$2 a ton instead of the present \$3.05.

The Frisco road's proposed new rate on Arkansas coal was approved April 16 by the Southwestern Freight Bureau, representing the seventeen railroads operating in the Southwestern area, including the trunk lines radiating from St. Louis into that territory. Approval by the bureau gives the Frisco authority to publish the tariff, but a spokesman for the bureau said that the matter would first be submitted to the Illinois Freight Association and the Western Trunk Lines Committee, representing carriers in Illinois and the North Central States. This is the usual procedure, he said, and it often results in composing differences and avoiding formal protests to the Interstate Commerce Commission. Thus, if approved by the I.C.C., the reduced rate would become effective within 60 days.

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Island Creek Orders Barges

Eight welded steel river barges have been ordered from the Bethlehem Steel Co. by the Island Creek Coal Co., Huntington, W. Va. Each will be 200 ft. long, 26 ft. wide and 10 ft. deep, with 1,200 tons capacity. The new craft will be added to the fleet now carrying coal on the Ohio River between Huntington and Cincinnati.

Keeping Step With Coal Demand

Bituminous Coal Stocks

	(Thousands of Net Tons)		
	Mar. 1 1940	Feb. 1 1940*	1939
Electric power utilities	9,051	9,069	8,456
Byproduct coke ovens	5,875	6,496	7,373
Steel and rolling mills	650	651	879
Railroads (Class 1)	5,269	4,992	6,736
Other industrials †	11,781	12,384	10,643
Total	32,626	33,592	34,087

Bituminous Coal Consumption

(Thousands of Net Tons)

	Feb.	Jan.	Feb.
	1940	1940*	1939
Electric power utilities	4,902	4,683	3,051
Byproduct coke ovens	6,654	6,668	4,346
Steel and rolling mills	1,106	1,029	759
Railroads (Class 1)	8,436	7,461	6,545
Other industrials †	12,085	11,190	9,482
Total	33,183	31,031	24,183

* Revised. † Includes beehive ovens, coal-gas retorts and cement mills.

Anthracite Conference Program Shows Broad Coverage

With completion of the program for the Third Annual Anthracite Conference, May 9 and 10, at Lehigh University, Bethlehem, Pa., President C. C. Williams has issued an invitation to members of the coal industry to attend. Dr. Williams said that "because all speakers have been requested to limit their papers to twenty minutes each and because many of them will be illustrated with lantern slides, the information described can be more easily absorbed than heretofore."

The conference will be divided into six sessions. Preliminary addresses will be made by Chairman Howard Eckfeldt and Dr. Williams. At the first session, under the chairmanship of William D. Plank, professor of mining engineering, Lafayette College, these papers will be presented: "Proper Use of Domestic Sizes of Anthracite in Home Heating," A. A. Norrman, fuel engineer, D. L. & W. Coal Co.; "Anthracite for Filtration, Including Case Histories Throughout the World," Homer G. Turner, filtration consultant, Anthracite Institute; "Mining and Combustion Engineering as an Opportunity for the Young Engineer," A. C. Callen, dean of School of Engineering, Lehigh University; "Mineral-Wool Insulation From Anthracite Ash and Anthracite Culm Banks," H. J. Rose and R. C. Johnson, Anthracite Fellowship, Mellon Institute.

A. C. Fieldner, U. S. Bureau of Mines, will preside at the second session, with these papers scheduled: "Application of Anthracite to Modern Baking Ovens," O. E. McGregor, vice-president, Williams Bakery, Scranton, Pa.; "Performance Progress of Domestic Anthracite Stokers and Indicated Need for Further Research," J. H. Simpson, general manager, MotorStoker Division, Hershey Machine & Foundry Co.; "Important New Data and Research on Chimneys and Drafts," Allen J. Johnson, director, Anthracite Industries Laboratory.

With W. H. Lesser, mining and electrical engineer, Pierce Management, in the chair, the third session will include these subjects: "The Economics of Preparation of Anthracite as Affected by the Sizing," Cadwallader Evans, Jr., vice-president, Hudson Coal Co.; "Present Market and Future Opportunities of Utilization of Various Sizes of Anthracite," J. D. Jillson, Anthracite Industries, Inc.

Presided over by Lauren E. Seeley, assistant professor, Yale School of Engineering, the fourth session has these topics on the tapis: "Radiant Heating," B. H. Jennings, associate professor of mechanical engineering, Lehigh University; "Plans and Progress of Anthracite Research at State College," A. W. Ganger, director of mineral industries research, Pennsylvania State College; "Interesting Applications of Anthracite Producer

Gas," Eric Sinkinson, associate professor of fuel technology, Lehigh University; "Operating Experience With Anthracite in Central Power Stations," G. H. Frick, Pennsylvania Power & Light Co.

The fifth session will find John F. Barclay, U. S. Bureau of Mines, in the chair and these papers scheduled: "Modern Methods for Handling Coal and Ash," Edwin L. Willson, sales promotion manager, Lehigh Navigation Coal Co.; "Anthracite in Cupolas," J. F. K. Brown, assistant general manager of engineering, Hudson Coal Co.

At the concluding session, S. H. Ash, district engineer, U. S. Bureau of Mines, will be chairman and these papers will be read: "Practical Results From the Use of Anthracite on Semi-Industrial Stokers," Joseph H. Kerrick, combustion engineer, Philadelphia & Reading Coal & Iron Co.; "Why Have Standards for Burning Equipment?" I. J. Fairchild, chief of Division of Trade Standards, U. S. Department of Commerce.

Cut in Rates to Hampton Roads Denied by I.C.C.

By the close margin of six to five, the Interstate Commerce Commission refused on April 1 to order reduced rates on bituminous coal shipped from mines in southern West Virginia, Virginia and eastern Kentucky to Hampton Roads, Va., for transhipment by vessels to destinations outside the Virginia capes. The complainant was the Property Owners' Committee, representing producers and shippers from the New River, Pocahontas, Tug River, Kenova-Thacker and eastern Kentucky fields. The plaintiffs asserted that they could not meet increased competition of fuel oil and other coal substitutes unless there was a reduction of 50c. per ton in rates, charged by the Chesapeake & Ohio, Norfolk & Western and Virginian railroads.

In its order denying the petition the Commission said: "We are of the view that the assailed rates are not shown to be higher than warranted by both the cost and the value of the service and that this record does not warrant a finding condemning these rates as unreasonable."

Reduced Rates Extended

The Alabama Public Service Commission has extended until June 30 reduced freight rates on coal which went into effect a year ago in a designated area of the State and were scheduled to expire on April 12. Railroads asked the extension in order to make a survey during the next three months to determine results of the experimental rates.

To Dismantle Thermal Mine

The Thermal mine, south of Edwardsville, Ill., said to have been one of the most modern in the State when it was opened shortly after the World War, will be dismantled, according to a statement by Otto Conrades, president of Donk Brothers Coal & Coke Co., owner of the property. The announcement followed collapse of efforts of members of Local 36, Progressive Mine Workers, to

raise \$30,000 and to assume obligations of \$45,000 to take over and continue operation of the mine. Joseph Albl, president of the local union, said the mine, which formerly employed 175 miners, could no longer operate profitably in the face of Guffey coal act provisions, the loss of a large coal contract, and the new anti-smoke legislation in St. Louis.

Mr. Conrades reported that directors of

Donk Brothers voted on April 5 to liquidate some of the assets of the mine unless the miners were able to acquire the property. He said the firm will retain coal rights in about 6,000 acres near Edwardsville, 10,000 acres in Montgomery County, and 12,000 acres in Bond County. These rights, he said, are worth about \$40 an acre, giving the firm's total holdings in coal rights a value of \$1,120,000.

Anthracite Section, A.I.M.E., Compares Notes On Region's Cleaning Methods

FIVE papers describing experiences with as many types of plants were presented at the spring meeting of the Anthracite Section of the American Institute of Mining and Metallurgical Engineers at a banquet held in the Scranton Club, Scranton, Pa., April 12. These addresses were followed by a motion picture showing self-loading shaking chutes in action. H. H. Otto, mining engineer, Hudson Coal Co., was toastmaster and W. H. Lesser, mechanical engineer, Pierce Management, Inc., acted as chairman of the technical session.

Comparing the specifications of several years ago with those of today, it is easy to see how much better coal is now being cleaned, said the chairman in the opening address. Cleaning by jigs and concentrating

tables in the Panther Valley was described by Charles Rubert, preparation engineer, Lehigh Navigation Coal Co. The impossibility of avoiding the mixing of coal with rock in heavily pitching beds makes the yield of coal per ton low. Specific gravities of the coal range from 1.55 to 1.75 and the jigs used are of either Liberty or Wilmot type. It is important, said Mr. Rubert, to remember that a change in one part of a jig must be followed by changes in other parts or the excellent effect of the change may be neutralized. Concentrating tables are used not only for buckwheat sizes but also for chestnut and pea flats. One attendant can service twelve tables.

Describing the Hydrotators at Trevorton Breaker, Trevorton, Pa. (see *Coal Age*, June, 1939, p. 48), Mr. Jones said the bank coal now being cleaned was being scraped up the rear of the pile by a flight conveyor and then as promptly washed down the front of the pile into the boot of the main flight conveyor of the breaker. The coal cleaned had stood in the pile for eighty years. No difficulty was experienced in reducing the ash in the cleaned coal to 9.6 per cent. Ash comprises 75 per cent of the refuse. A hundred tons of clean coal is delivered every hour. Every half hour, tests are made to ascertain the ash in the coal. The only part replaced has been a new impeller on the pea size. Only five men are employed in the breaker.

Chance coal preparation at Marvine breaker of the Hudson Coal Co. (*Coal Age*, Nov. 24, 1921, p. 833) was detailed by John Johnson, superintendent of preparation, maintenance and construction, who declared that coals from rice to broken are being washed in a single cone and that they are well cleaned. Wherever possible, rubber pipe is used with the cones. The scouring action of the sand does not wear rubber as it does metal pipe. Also acid water is without effect. Recently the metal pipe and valve which release refuse from the slate box have been replaced by rubber pipe. Valving is achieved by use of a pinch valve which compresses the rubber pipe, thereby controlling the passage of slate through it. At the Olyphant breaker, these rubber pinch valves open and close every two minutes. For two years, no metal valves have been installed in the Marvine breaker for wash water, as pinch rubber valves have been preferred.

Cost per ton for preparation at Dorrance colliery's Rheolavator plant (see *Coal Age*, September, 1930, p. 535), declared Gene Florey, Lehigh Valley Coal Co., is 10c. for labor and 1c. for material per ton plus 10.9



A corner in Hudsons. From left to right, C. A. Peterson, safety inspector, Hudson Coal Co., with the following colliery superintendents, K. A. Lambert, Coal Brook; J. M. Reid, Olyphant; K. S. Hughes, Marvine; James Dixon, Pine Ridge.

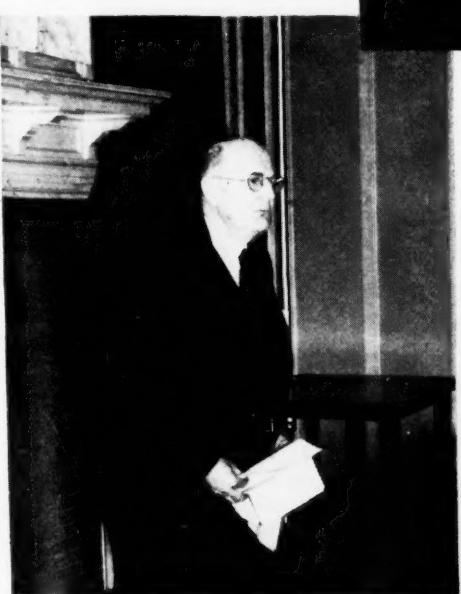


H. H. Otto, mining engineer, Hudson Coal Co., as chairman of the section, piloted the meeting.

From the West Virginia University came C. E. Lawall, its president, who is chairman of the Coal Division (left). In the center is (Skipper) Howard Eckfeldt, Lehigh University, from whom many of those present received their training. Glad-handing Dr. Lawall is K. A. Lambert.



T. Eichler, mechanical engineering department (left, of course); R. H. Dougherty, general superintendent, Payne Coal Co.; J. M. Humphrey, assistant mining engineer, and H. K. Keller, mining engineering department. All Lehigh Valley Coal Co. men but Mr. Dougherty, and he formerly directed that company's Humboldt colliery.



Bill Lesser, mechanical engineer, Pierce Management, Inc., made opening speech and introduced speakers.



mills for repair labor and 2.8 mills for repair material, or about 13c. per ton in all. Thirty-five men are employed. Describing the new Huber plant, Glen Alden Coal Co. (*Coal Age*, April 1939, p. 68), with its Menzies cones, John Doughty, preparation engineer, stated that repair and maintenance labor costs were 0.23c. and material costs 0.73c. per ton, a total of 0.96c.

In reply to W. L. Remick, Wilmot Engineering Co., Mr. Rubert said that the steamboat and broken jigs operated with a material cost of 1.6c. per ton and a labor cost of 0.7c. per ton, or a total cost of 2.3c. The meeting closed with a film showing the operation of automatic duckbills presented by Goodman Manufacturing Co.

Allocation Plan Shows Promise For Stabilization

Results of the first seven weeks of the allocation plan for stabilization of the anthracite industry were characterized as very encouraging by Alan C. Dodson, president of Weston Dodson & Co. and head of the Anthracite Operators' Association, in an address on March 29 at a meeting of the Rotary Club of Bethlehem, Pa. Through it he foresaw benefits to the consumer, retailer and operator.

The plan, he said, would eliminate bootleg mining and grading of coal. "The three or four million tons of bootleg coal," he added, "will be put back into legitimate market channels and come within tonnage allocation, thus ceasing to be a price and quality menace in many communities. When grading of anthracite coals becomes an accomplished fact, competition, both wholesale and retail, will be better, for no longer will inferior coal dictate the price of better grades. Coal will be sold for what it is; Grade B coal will be sold as Grade B, and the customer will know what he is buying and why he pays less than he would for Grade A."

Research Fellowships Offered

To assist in the development of mining and related industries and to encourage research on problems of interest to such industries, the U. S. Bureau of Mines, in cooperation with the University of Maryland, offers three fellowships for post-graduate work and research for the academic year 1940-41. Holders of the fellowships become candidates for the degree of Doctor of Philosophy from the University of Maryland and give about half their time to research work under the direction of specialists in the Bureau of Mines in the Eastern experiment station adjoining the campus of the university. The fellowships carry remission of tuition fees and in addition pay the holder \$600 per year.

One of the fellowships will be assigned to research in the Coal Division of the Bureau of Mines, a second in the Metallurgical Division, and a third in the Non-metals Division. The fellowships are open to graduates of universities and technical colleges who have the proper training in engineering or applied science and who are qualified to undertake research work.

Hanna Coal Company Cleveland

TO OUR MANY SYMPATHETIC FRIENDS:

In the confusion of the early hours of our disaster, many of our friends rendered us assistance in such a quiet unassuming way that we were not conscious of their presence. Many others, by telephone and personal visit to Willow Grove, offered us assistance.

Unfortunately, now that things have quieted down, we know we have overlooked many people whom we desire to personally thank and we are, therefore, taking this means of doing so.

Thanks to a loyal organization and the prompt arrival of many well equipped neighbors, we had more assistance than we could use. Those of you who were present will likewise appreciate the wonderful help we received from the Ohio State Mining Department, U. S. Bureau of Mines, the West Virginia Mining Department, the Ohio State Highway Patrol, the American Red Cross, the Salvation Army, our County officials, and the community in general.

For all this help we are most sincerely grateful and only regret that we cannot thank each and every one personally.

Sincerely,



R. L. Ireland, Jr.,
President.

Hanna Thanks Industry for Help and Sympathy

This is a reduced facsimile of a letter expressing appreciation for aid rendered by various organizations, officials and the community after the Willow Grove disaster of March 16.

Ickes Issues "Progress Report" On Willow Grove Blast

"A preliminary progress report" of the U. S. Bureau of Mines on the explosion at the Willow Grove mine of the Hanna Coal Co., Neffs, Ohio, on March 16, in which 72 men were killed, was made public April 1 by Secretary of the Interior Harold L. Ickes. The report does not attempt to draw conclusions as to the cause of the disaster but summarizes the events which took place at the time of the explosion, recounts the rescue operations, and gives data as to working and operating conditions.

The report describes the disaster as a "dust explosion with the possibility that gas may also have been involved." The mine is rated as non-gassy by the Ohio Department of Mines, but the report asserts that fine coal dust was observed in the mine, which was described as being "dry and dusty," with no water used to allay dust. The coal is mined mechanically, black pellet powder ("a type of explosive long condemned by the Bureau of Mines as dangerous") being used for blasting. Mining machines were described as "non-permissible"—that is, not regarded by the Bureau of Mines as being of the most safe type.

The report recommended:

"1. That the use of black blasting powder be discontinued and only permissible explosives, stemmed with incombustible ma-

terial and used in a permissible manner, be used for blasting coal and rock.

"2. That the mine be cleaned of excess dust and that all openings (haulageways, entries, aircourses, rooms and crosscuts) be thoroughly rock-dusted and so maintained.

"3. That water be used on mining machines, loading machines, before and after blasting, and on loaded and empty cars to allay coal dust.

"4. That permissible electric equipment be used throughout the mine excepting that which is operated on pure intake air fresh from the outside.

"5. That the system of ventilation be arranged with sufficient splits to efficiently ventilate the mine and that all haulageways be placed on intake air.

"6. That an efficient checking in and out system be installed and used so the number of men who are in the mine can be definitely determined at any time."

More Mine Plant Fires

Fire on April 5 destroyed the tipple of the newly formed Snap Creek Coal Co. at Aracoma, W. Va. According to estimates by company sources, the loss was \$50,000.

Another fire which swept through the company store and eight dwellings at the Vera Pocahontas Coal Co. plant, near Laeger, W. Va., on March 23 caused damage of about \$25,000.

Bituminous Minimum Price-Fixing Preliminaries Enter Final Stages at Washington

WASHINGTON, D. C., April 24—The long-drawn-out preliminaries in Uncle Sam's second attempt at fixing minimum mine prices on bituminous coal under the Guffey-Vinson act entered their final stages the tag-end of March. Release of several sections of the report of the three trial examiners who began hearings on the bituminous price structure of the country May 19, 1939, was coupled with a statement from Director H. A. Gray of the Bituminous Coal Division, Department of the Interior, that there would be "an effective floor under coal prices within a few weeks."

The time limit implied in this announcement, however, should not be construed too rigidly. Both the physical task of multi-graphing the voluminous report of the Division examiners and the steps set up to fore-stall using procedural grounds as the basis for a repetition of court attacks upon prices fixed make it highly unlikely that the new price schedules will be made effective before June 1. Even that date seems optimistic when the formalities still to be complied with are considered. Eastern objectors to the proposed schedules have fifteen days in which to file protests and exceptions to the examiners' findings; Western protestants are allowed twenty days. And this time does not begin to run until the last page of these findings has been made public.

Some time necessarily must elapse between the filing of such protests and the issuance of orders making the price schedules effective. Just how much, of course, will depend upon the volume and nature of the protests made. Under the procedure adopted, protestants may not only submit briefs but also may request time for oral arguments. After the director has considered these objections and issued his orders, protestants are allowed another ten days in which to file appeals with the Secretary of the Interior. According to General Counsel Fortas of the Bituminous Coal Division, there may be a lag of 15 to 30 days between the director's orders and their effective date. The length of this lag, he said, will depend upon how many changes the director makes and the general nature of his orders.

Western Proposals First

First releases of material from the office of the director on March 23 included three sections and eight appendices of the examiners' report in General Docket No. 15. This is the docket which deals with minimum prices, marketing rules and regulations, and coordinated minimum prices for all the producing districts named in the law except District 21. That district covers the mining fields of the Dakotas and was excluded from the provisions of the act by an earlier finding that the coal produced in those States is lignite and not bituminous in rank. Whether the statute also applies to Arkansas anthracite is still in issue in an appeal now pending before the Supreme Court of the United States on petition of the Binkley Sunshine Anthracite Coal Co.

Portions of the examiners' report released on March 23, but not made available for

public inspection until March 25, covered: (1) proposed general findings of fact and recommendations; (2) proposed findings of facts and schedules of minimum prices on rail shipments from Districts 16 to 20 and Districts 22 and 23, and (3) schedule of recommended marketing areas for all markets. On March 28, the report of another trial examiner, dealing with the maximum allowable discounts to registered coal distributors, was filed. Oral arguments on exceptions to this report were heard by Director Gray on April 18.

Recommendations covering proposed coordinated minimum mine prices on coals produced in the Appalachian, Midwestern and Southwestern fields (Districts 1 to 15) were not filed until April 13 and were not made available for general public inspection until two days later. This release included only the proposed price schedules. Findings of the trial examiners in support of these schedules, it was announced, would be made public this week. This section of the report will be a document of 2,500 to 3,000 pages or more. Copies of the reports have been mailed to parties participating in the hearings and also are on file at the offices of the National Coal Association in Washington and Chicago, local coal producers' associations, district coal producers' boards and the district offices of the Bituminous Coal Division. There will be no general public distribution of the documents.

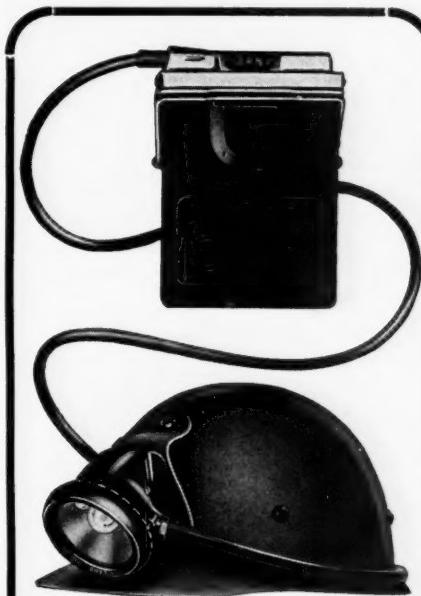
1,014 Pages of Schedules

The price schedules for the 22 districts take up 1,014 pages. These schedules, showing literally hundreds of thousands of individual mine prices, are designed to fix the minimum figures below which over 11,000 members of the Bituminous Coal Code provided for in the law may not go in the sale of their coal. By far the largest number of code members listed are operators of truck mines. Membership in this group approximates 9,160 companies and individuals operating over 9,300 mines. The code lists show over 2,000 companies shipping either by rail or by rail and truck; this group operates nearly 2,750 mines. Details on the breakdown by districts between the two types of operators are shown in Table I.

For the country as a whole, the recommended minimum prices will yield an average estimated mine realization of \$2.072 per ton. This is 11c. per ton above the average realization for 1937 but 1.6c. below the weighted average cost of production—\$2.088.

Railroads Buy More Coal

Expenditures by Class 1 railroads for fuel in 1939 totaled \$257,273,000, compared with \$243,783,000 in the preceding year. For bituminous coal alone they spent \$193,079,000 last year, an increase of \$13,005,000 over 1938; for anthracite, \$4,925,000, an advance of \$1,592,000. Purchases of fuel oil by the carriers amounted to \$52,334,000, a decrease of \$1,219,000.



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New WHEAT ELECTRIC CAP LAMP Model GW (Approved by U. S. Bureau of Mines)

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Table I—Code Members and Mines by Districts

District @	Total		Railroad		Exclusive Truck	
	Companies *	Mines	Companies *	Mines	Companies *	Mines
1	1,549	1,787	333	506	1,216	1,281
2	1,067	1,178	148	244	919	934
3	403	439	112	143	291	296
4	1,469	1,498	126	143	1,343	1,355
5	9	10	3	3	6	7
6	105	110	20	25	85	85
7	234	315	115	195	119	120
8	1,797	1,968	344	503	1,453	1,465
9	308	330	47	66	261	264
10	844	888	107	148	737	740
11	671	796	60	82	611	624
12	360	377	63	70†	297	307
13	582	618	52	77	530	541
14	195	198	195	198	**	**
15	787	796	118	123	669	673
16	48	54	13	19‡	35	35‡
17	270	295	56	81‡	214	214‡
18	35	36	13	13‡	22	23‡
19	102	120	12	30‡	90	90‡
20	90	95	21	26‡	69	69‡
22	179	180	17	18‡	162	162‡
23	65	75	26	33‡	39	42‡
Totals	11,169	12,073	2,001	2,746	9,168	9,327

@ For description of districts, see Table III.

* Includes companies and individual operators.

† 38 mines listed as shipping via public sidings and ramps for railway delivery.

‡ No exclusive truck mines; all rail mines in schedule also listed for truck-price shipments.

§ Estimated.

The deficit arises from the fact that the average minimum prices for Minimum-Price Area No. 1 (Appalachian region exclusive of Alabama, Georgia and southeastern Tennessee, but including the State of Michigan) and for Minimum-Price Area No. 6 (Colorado, New Mexico and Arizona) are 4c. and 2.1c. per ton less, respectively, than the weighted average costs for those areas. For the other minimum-price areas, however, the recommended prices range from an average of 0.8c. per ton above average weighted costs in the Southwestern region to 5.2c. in the Midwestern States. Comparisons for all minimum-price areas are shown in Table II.

Generally speaking, the proposed prices are the lowest in the history of government regulation of the bituminous industry. For the most part, the recommended figures are substantially under those promulgated by the defunct National Bituminous Coal Commission in the first price-fixing venture of 1937-38 under the present law. The new schedules also differ in many respects from those proposed by the Commission last summer prior to its abolishment under a Presidential Reorganization Order and the transfer of its functions to the Bituminous Coal Division

of the Interior Department. These Commission schedules, however, furnished the groundwork for the hearings held by the Division trial examiners. Present recommended prices also are lower than many of the prices established under NRA.

Provision is made in some of the district schedules for prices on as many as 341 specific sizes and grades, with raw and washed coals treated separately. Individual sizes are grouped for price-making purposes, however, so that the actual number of size groups upon which specific prices are recommended is considerably less. The maximum number of such groups is incorporated in the proposed schedule for District 11 (Indiana), where provision is made for 34 such groups, while District 10 (Illinois) and District 9 (western Kentucky) both have prices for 29 groups. Size groups for all districts are shown in Table III.

Among the major changes recommended by the Division trial examiners were revisions in mine prices on coals moving to destinations via inland waterways. During the hearings, consumers on the Ohio and Mississippi River systems complained that the prices

Table II—Code-Price Income vs. Mine Costs

Minimum-Price Area	Average Mine Income Per Ton	Average Mine Cost Per Ton
1—Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Michigan, eastern Kentucky and northeastern Tennessee	\$2.088	\$2.128
2—Western Kentucky, Illinois, Indiana and Iowa	1.814	1.762
3—Alabama, Georgia and southeastern Tennessee	2.463	2.438
4—Arkansas and part of Oklahoma	3.650	3.698
5—Missouri, Kansas, Texas and part of Oklahoma	2.047	2.039
6—Colorado, New Mexico and Arizona	2.718	2.739
7—Wyoming and part of Idaho	2.184	2.169
8—Dakotas	*	*
9—Montana	1.496	1.485
10—Oregon and Washington	3.257	3.225
Total	2.072	2.088

* Not included because only lignite coal is produced.

Table III—Size Groupings for Rail and Truck Mines

Producing Districts	Number of Size Groups	
	Rail Mines	Truck Mines
1—Central Pennsylvania, Maryland and Grant, Mineral and Tucker Counties, West Virginia	5	5
2—Western Pennsylvania	16	11
3—Northern West Virginia	16	7
4—Ohio	12	8
5—Michigan	19	19
6—West Virginia Panhandle	12	8
7—Southern No. 1 low-volatile	10	6
8—High-volatile	27	6
9—Southern No. 2 low-volatile	10	8
10—High-volatile	24	8
11—Western Kentucky	29	29
12—Illinois	29	29
13—Indiana	34	34
14—Iowa	10	10
15—Alabama and Georgia	26	26
16—Southeastern Tennessee	15	15
17—Arkansas-Oklahoma	23	20
18—Southwestern	15	15
19—Northern Colorado	13	13
20—Southern Colorado	19	19
21—New Mexico	16	16
22—Wyoming	17	17
23—Utah	15	15
24—Montana	14	14
25—Washington	26	26

Permissible Plates Issued

Two approvals of permissible equipment were issued by the U. S. Department of Mines in March, as follows:

Goodman Mfg. Co.: Type L-14CJ longwall mining machine; 50-hp. motor, 210 volts, d.c.; Approval 394; March 16.

Joy Mfg. Co.: Type T3-1 caterpillar truck; two 3-hp. motors; 220 and 440 volts, a.c.; Approvals 395 and 395A; March 19.

proposed by the old Commission deprived them of the legitimate advantages of cheaper modes of transportation. As a result of these protests the examiners took the position that the price structure should not be so framed as to discriminate in favor of movement by railroad where normally the buyer could save money by using river transportation. Whether the protesting consumers and interested producers will feel that the changes incorporated in the new schedules are in accord with this general declaration, however, remains to be seen.

Recommended prices for railroad fuel range from \$1.65 per ton on western Kentucky coal sold to the Louisville & Nashville RR. to \$3.35 on Michigan coal sold to the New York Central. Railroads, in the forefront of the court attacks on the 1937-38 schedules, made no concerted objection to prices proposed by witnesses for the Division during the recent hearings. Specific protests, however, were entered by nine carriers. These were: Akron, Canton & Youngstown; Carolina-Clinchfield & Ohio; Chicago & Eastern Illinois; Chicago & Great Western; Chicago, Milwaukee, St. Paul & Pacific; Chicago, Rock Island & Pacific; Missouri Pacific; New York, New Haven & Hartford and the Rutland railroads.

Sympathetic ear was given to the protests of all except the Carolina-Clinchfield & Ohio, Chicago & Eastern Illinois and New Haven lines. In the case of the Akron, Canton & Youngstown, proposed prices were reduced 10c. Partial relief was recommended in prices on fuel for the Rutland. The plea of the New Haven for a price of \$1.65 instead of \$1.85 on northern West Virginia coal was denied; the \$1.65 price, remarked the examiners, is substantially below the cost of production. In the case of the Missouri Pacific, a reduction from \$1.85 to \$1.60 in the price of Belleville district (Illinois) coal was recommended.

The recommended price of \$1.87 on 3-in. Beckley slack moving to New England markets is 21c. less than the old Commission price and 13c. under NRA minima. Under the proposed schedule, Pocahontas slack is priced 10c. per ton less and Sewell slack 5c. per ton less than Beckley steam. A price of \$2.45 is recommended for domestic mine-run; the old Commission price was \$2.55 and the NRA schedule was \$2.80. A plea that prices on West Virginia coals be boosted to permit producers in central Pennsylvania to ship by rail into New England markets was rejected. The \$1.87 price on Beckley slack also is proposed for the New York City area, with \$2.15 on South Fork slacks and \$2.02 on Pocahontas industrial mine-run.



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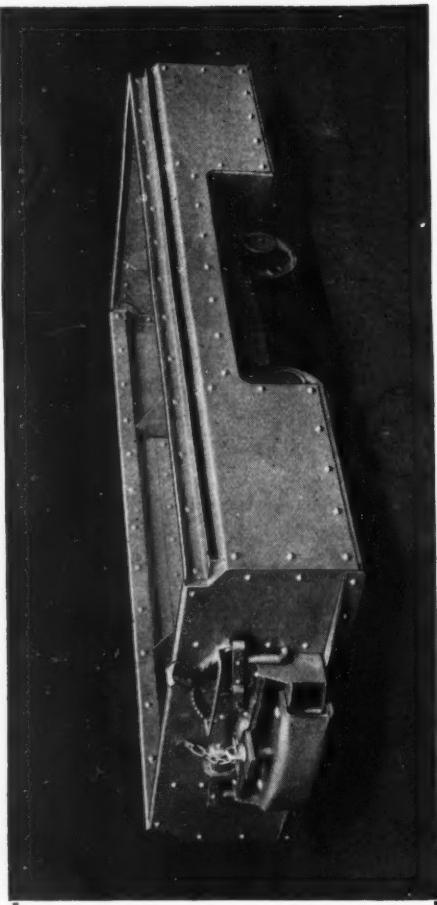
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All these prices, as well as the proposed \$2.45 on South Fork mine-run, are under the old Commission and NRA schedules.

Proposed prices for the Pittsburgh district show only slight variations from the old Commission and NRA schedules on typical coals. Near-by producers' claims on the market are recognized by relieving them of the necessity of increasing prices to permit competitors with higher freight rates an opportunity to ship into the area on a "competitive" basis. Ohio producers were given a break in the Cleveland-Akron-Canton-Massillon area when the examiners recommended adjustments in the price structure of competitive coals from other States on the ground that the prices proposed for such coals by the old Commission were too low.

Prices recommended for the Chicago area, according to the Bituminous Coal Division, show many substantial reductions under the prices first set up by the old Commission and numerous changes from those proposed by that body at the time it was superseded by the Bituminous Coal Division. Compared with the 1937-38 Commission prices, the present proposals on screenings range from 25 to 45c. per ton lower. These proposals, however, are fairly well in line with current quotations on standard grades in the Chicago market.

Coal treated to allay dust is generally priced 10c per ton above untreated in all districts and market areas east of the Missouri River; the surcharge is 10 and 25c. in Rocky Mountain and Pacific areas. Mechanically cleaned coal also carries a surcharge of 10c. per ton in some districts, and washed coal is priced 20c. above raw fuel in certain fields.

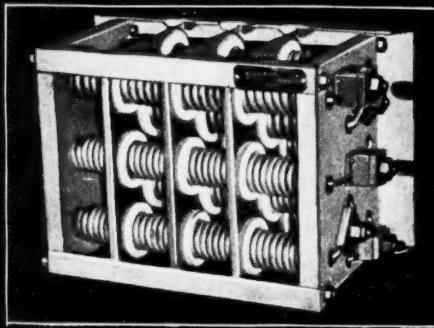
Provisions for seasonal discounts on domestic grades and sizes are incorporated in a number of the district schedules. In some cases these discounts also apply to dedusted screenings, for example, may allow a discount of 50c. per ton on April deliveries, grading down month by month in 10c. steps. Alabama seasonal discounts start at 75c. per ton in April and drop to 15c. in October. The discount system on summer deliveries for Illinois coals also is recognized.

A number of the Far Western schedules make provision for reductions of from 15 to 40c. per ton on deliveries of coal to consumers who use fuel only part of the year, but have storage facilities for 30 per cent of their demands and are willing to accept shipments at the option of the producer. Special competitive situations where coal must meet the prices of unregulated rival fuels also are recognized in authorization of subnormal prices. Slack from the Roslyn (Washington) district is priced 60 and 80c. per ton lower when for shipment to Pullman, Wash., than to many other Washington and Idaho destinations because of competition with "hogged fuel" (ground lumber refuse) in the Pullman market area.

Killed in Auto Wreck

J. Valentine Hinshelwood, 49, general superintendent, Elk River Coal & Lumber Co., Widen, W. Va., was killed April 3 when an explosion wrecked the automobile he was driving, near Clay, W. Va. He had been superintendent at Widen for the last thirteen years and took an active interest in civic affairs.

RESISTANCE THAT STANDS THE GAFF



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COAL AGE — Vol. 45, No. 5

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Trouble Shooting on Electrical Equipment Engrosses Illinois Group

M ECHANICAL and electrical troubles, and their cure, engaged the attention of the Mining-Electrical Group of Southern Illinois at its regular monthly meeting, held April 5 at West Frankfort with J. C. (Pat) Heap as guest speaker. Mr. Heap, who has been service man for the General Electric Co. in Illinois and adjacent mining fields for more than sixteen years, prefaced his remarks with the reminder that his work differed from that of his hearers only in the broader opportunity offered by his larger field of activities. Beginning with motor-generator sets, the discussion covered several divisions.

As proof that service shops are not immune to error, Mr. Heap related a case where a newly rewound rotating synchronous motor field was found to have three adjacent fields of a six-pole rotor of one polarity and the remaining three of opposite polarity. The odd feature was that it ran at normal speed and carried only about 65 per cent load before falling out of step. But it ran very hot.

In discussing burned spots on synchronous-motor collector rings, the cause was indicated to be the inrush of transformer-action current at the moment of closing the starting switch. A statement was made from the floor that in a 435-kva. motor (300-hp. m.g. set) inrush current would approximate 175 amp. and that four brushes, instead of the customary one, would add enough carrying capacity to stop the ring from burning. Increasing brush tension, it was pointed out, also would help.

Rotor field shorts, said the speaker, usually are located by voltage-drop measurements. When not in evidence with the machine standing but manifest by vibration when in operation, they can be located by driving wedges between coil and pole-piece and then using the voltmeter. The shorted field may then be replaced. Vibration from mechanical unbalancing is corrected in the field by trial and error, using small weights. Most machines have provision for threaded weights or pockets for lead. It was brought out that synchronous motors vibrating because of field shorts that occur during operation may be shut down by a relay in series with the motor field. Increased current flow will trip the breaker.

Mr. Heap emphasized that the only way to assure satisfactory operation with automatic control on m.g. sets is by frequent inspection. With increased complexity, more frequent expert attention is required. A case history of three automatic stations showed perfect service under weekly inspection but constant difficulty when inspections were omitted. "The assertion that automatic equipment requires no attention is a fairy tale," he commented.

Shaft current in such volume as to erode seriously or destroy bearings in large hoist motors and other heavy electrical equipment, said Mr. Heap, occasionally is a matter of grave moment. The remedy is insulated pedestals or bearings. Grounding the shaft through a carbon brush may help but will not cure this kind of trouble, the speaker declared. The case of a 1,000-hp. motor

where babbitt bearings did not last a month was cited. Mr. Heap said it is regular practice to insulate one bearing of turbogenerators.

The need to notify the supplying power company when an important new installation is to be put on the line was brought out by an instance in which three days' time was consumed hunting the trouble which caused a breaker to open and shut down three industrial plants. Inrush current to a 350-hp. compensator was found to be about 2,600 amp. for the first two or three cycles. This occurred independently of whether the motor leads were connected or not. The current was measured by blocking the instrument hand over to the approximate current and noting if it registered a kick. Otherwise, the time duration was too short to get a reading with an ordinary instrument. There was no trouble; the breaker merely needed setting for higher trip value.

Successful commutation, it was shown, is dependent on the mechanical condition of the commutator and on the flexibility of the brush system as well as on load and machine design. A good job of commutator grinding can be done with a stone if a rigid guide is provided, but wheel grinding is preferable because it leaves a truly cylindrical surface. Double brushes in "V" brush holders have proved advantageous for some severe reversing applications, such as hoist motors on stripping shovels.

On maintenance work, Mr. Heap insisted that ball and roller bearings should be kept in the original wrapper until ready to slip into the housing. "Keep them clean even if the mine is dirty," he said; otherwise, life will be greatly reduced. He pointed out the necessity of proper lubrication and the use of a moderate quantity of high-grade non-acid grease. "Don't use cheap cup grease." Overgreasing causes bearings to run hot.

Having had wide experience with coal washeries, Mr. Heap put himself on record as favoring inclosed fan-cooled ball-bearing motors for that application, despite the fact that coal dust apparently is not detrimental to motors. However, he pointed out that coal dust is combustible. He cited a local plant having such equipment with fifteen-year trouble-free service as justifying his recommendation.

Personal Notes

ORRIN T. BARRETT, formerly foreman at the Champion No. 3 plant of the Pittsburgh Coal Co., has been appointed standards engineer for the company, with headquarters in Pittsburgh, Pa.

ARTHUR BEYER, formerly chemist at the Golden Zone mine, Colorado Station, Alaska, has joined the Pittsburgh Coal Co., Pittsburgh, Pa., as engineer.

ALLEN COE, formerly chief legal adviser to the Consumers' Counsel, Bituminous Coal Division, has opened offices for the practice of law before the Bituminous Coal Division, National Labor Relations Board, Interstate Commerce Commission and other government



Robert C. Hill

agencies. His offices are in the Bowen Building, Washington, D. C.

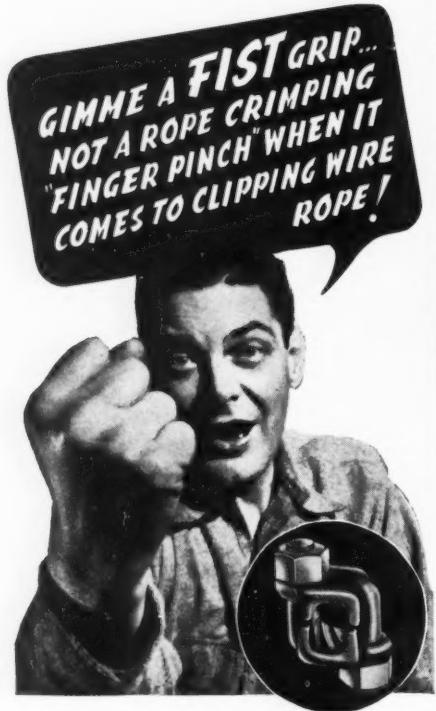
R. M. DAVIS, president of the Davis-Wilson Coal Co., Morgantown, W. Va., wants John M. Garner's job as Vice-President of the United States. As the State Secretary of State's office discovered that there was nothing in the law that provided for filing for Vice-President in the primary, however, Mr. Davis said he would take the circuitous route of filing for the presidential nomination, and then, after the primary, "request my delegates to withdraw for me as President and support me for Vice-President." He proposes to run on the Republican ticket.

MIKE DEPETRO, formerly superintendent at No. 21 mine of the Island Creek Coal Co., Logan, W. Va., has been transferred to the superintendence of No. 14 mine, Whitmans, W. Va., vice C. W. Walker, who recently was appointed general superintendent of the Pond Creek Pocahontas Co.

ALAN C. DODSON, president, Weston Dodson & Co., Inc., was reelected president of the Anthracite Operators' Association at a reorganization meeting held March 28 at Wilkes-Barre, Pa. Other officers renamed are: vice-president, BYRON W. SLEPPY, Avondale Coal Co.; treasurer, BRUCE PAYNE, president, Payne Coal Co. Directors named are: Wyoming district—SANTO VOLPE, Volpe Coal Co.; J. B. McDade, Heidelberg Coal Co., and W. S. JERMYN, Jermyn-Green Coal Co. Lehigh District—DONALD MARKLE, Jedd-Highland Coal Co., and T. F. STEELE, T. F. Steele Coal Co. Schuylkill District—JAMES H. PIERCE, East Bear Ridge Colliery Co.; H. M. SMITH, St. Clair Coal Co., and B. H. HAY, Repplier Coal Co.

THOMAS G. FEAR has resigned as general manager of operations of the Elk Horn Coal Corporation, Wayland, Ky. GEORGE POW, chief engineer for the last several years, has been named acting general manager of operations at Wayland and Garrett. B. M. ROGERS has been appointed manager at Wayland.

ROBERT C. HILL, chairman of the board and president of the Consolidation Coal Co., has accepted the chairmanship of the coal and coke section for the 1940 campaign of



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the Greater New York Fund. Now in its third year, the fund, through its affiliated agencies, annually helps serve nearly two million New Yorkers who need assistance.

R. E. HOWE, president; A. L. BROWN, vice-president, and W. M. WILSHIRE, secretary-treasurer, were reelected by Appalachian Coals, Inc., at its annual meeting during the first week in April. Other officers named are: J. E. TOBEY, vice-president, and L. E. JAMISON, assistant secretary-treasurer. Mr. Brown was reappointed as manager of the marketing division, and Mr. Tobey as manager of the fuel engineering division. T. A. DAY, formerly assistant secretary, was reappointed as manager of the Southeastern office, Knoxville, Tenn.

JOHN HUNT, general manager of the Western Fuel Co. and superintendent of the Canadian Collieries, Ltd., Vancouver, B. C., has resigned, but will be retained as consulting engineer. Once fireboss in the old Brechin mine, he has at different times been overman, mine manager, and finally general manager with the Western Fuel Co. since 1926. J. BAIRD succeeds Mr. Hunt, and ROBERT K. SMART will be assistant manager.

R. L. IRELAND, JR., was reelected president of the Ohio Coal Association at its annual meeting on April 15. Other officers, also renamed, are: E. H. DAVIS, vice-president, and EZRA VAN HORN, executive vice-president.

SOL JENKINS, vice-president and general manager, Gowen Coal Co., Fern Glen, Pa., has assumed the management of the Cranberry Improvement Co. operation at Cranberry, which he formerly held. He will retain his post with Gowen.

GEORGE H. JONES, general manager, Stevens Coal Co., has become president of that company consequent on the death of N. D. Stevens, of Tunkhannock, Pa. The office of the company, formerly in the Miners Bank Building, Wilkes-Barre, Pa., has been moved to 25 West Independent St., Shamokin, Pa.

M. D. KIRK, vice-president in charge of operations, Vesta Coal Co., Pittsburgh, Pa., has been appointed alternate representative on the mining standards correlating commit-

tee of the American Standards Association, replacing H. E. NOLD, professor of mining engineering, Ohio State University, recently made chairman of the committee, vice A. W. HESSE, chief coal mining engineer, Youngstown Sheet & Tube Co., who resigned.

H. D. KYNOR, formerly general manager, Coxe Bros. & Co., Jeddo, Pa., has resumed his position with Pierce Management, Inc., Scranton, Pa., now that the remaining Coxe mines have been absorbed by the Jeddo-Highland Coal Co. as of April 1.

JOHN S. MCGHEE, formerly superintendent at No. 20 mine of the Island Creek Coal Co., Whitmans, W. Va., has been transferred to the superintendency of Nos. 1 and 21 mines, Logan, W. Va.

E. MOONEY, formerly superintendent at No. 1 mine of the Island Creek Coal Co., Logan, W. Va., has been transferred to No. 20 mine, Whitmans, W. Va., in the same capacity.

JOHN MURRELL, assistant foreman for the Harvey Coal Corporation, Harveyton, Ky., has been promoted to safety engineer and preparation man.

AUGUSTUS K. OLIVER was elected chairman of the board of the Pittsburgh Coal Co., Pittsburgh, Pa., at a recent directors' meeting. He succeeded ALAN M. SCAIFE, who retired because of the pressure of other business.

J. D. ROGERS, vice-president and general manager, Stonega Coke & Coal Co., has been named president of the Virginia Coal Operators' Association. Other officers chosen are: vice-president, CHARLES E. RALSTON, general manager, Benedict Coal Corporation; secretary-treasurer, GEORGE H. ESSER.

DR. R. R. SAYERS has been detailed to direct the affairs of the U. S. Bureau of Mines as acting director. The appointment was made by President Roosevelt, on recommendation of Secretary of the Interior Ickes, during the first week of April, effective immediately. Dr. Sayers is well known for his health and safety work, having joined the Government Public Health Service in 1914. From 1917 to 1932 he was detailed to the Bureau of Mines, directing its health and safety work during that period. Since then he has been in charge of industrial hygiene and sanitation in the Public Health Service.

RICHARD D. SNOUFFER, recently lubrication engineer with the Pittsburgh Coal Co., Pittsburgh, Pa., has been transferred to the preparation department.

Tyler Mines Change Hands

Tyler mines, near DuBois, Pa., operated during the last three years under lease from the Powhatan Coal & Coke Co. by the Underhill Coal Mining Co., Inc., St. Marys, Pa., was acquired by the latter company on March 30. Included in the deal were about 80 houses, 5,000 acres of land with standing timber, and more than 1,500,000 tons of coal. A. J. Palumbo, president of the Underhill company, figures on opening new drifts on the property this summer.

Regulations for Sheathed Powder Adopted in Utah

Regulations governing the use of sheathed powder in coal mines were adopted April 12 by the Utah Industrial Commission, to become effective on May 4. Sheathed powder is explosive covered with an envelope containing sodium bicarbonate, which has the effect of inclosing and cooling the hot gases resulting from detonation of the powder.

The regulations are based on recommendations presented to the Commission by a special committee consisting of W. D. Bryson, W. N. Wetzel and George A. Schultz, representing the operators, and A. L. Mangum, Lyle Hyatt and Joe Dowd, for the miners. The above six chose James Morgan as an additional member.

Correcting the Record

Through a misunderstanding, it was erroneously reported in "Milestones in Coal Preparation," in the February, 1940, *Coal Age*, p. 75, and in the article on the new Arydale preparation plant of the Maumee Collieries Co., March, 1940, *Coal Age*, p. 41, that the Link-Belt trough washer used at Arydale was the first such unit to be installed in a coal-preparation plant. Actually, the first such trough washers were installed by the Island Creek Coal Co. in 1936, as reported in "Milestones in Coal Preparation."

Stoker Men Adopt Standard

Standard setting heights for underfeed stoker equipment in boilers burning bituminous coal, recommended by the engineering committee of the Stoker Manufacturers' Association, were unanimously adopted by the association March 12 at a meeting of its executive representatives in Chicago. The standard covers boilers from the smallest household unit up to machines burning 1,200 lb. of coal per hour. The association points out that, while no hard and fast rules are

prescribed, the standard offers recommendations on the allowable clear space between the stoker retort and the crown sheet of the boiler based on the practical experience of leading manufacturers as well as dealers and installers in the stoker industry over a period of many years. Copies of the new code may be obtained from Marc G. Bluth, secretary, Stoker Manufacturers' Association, Chicago.

A.I.M.E. Coal Session Coming

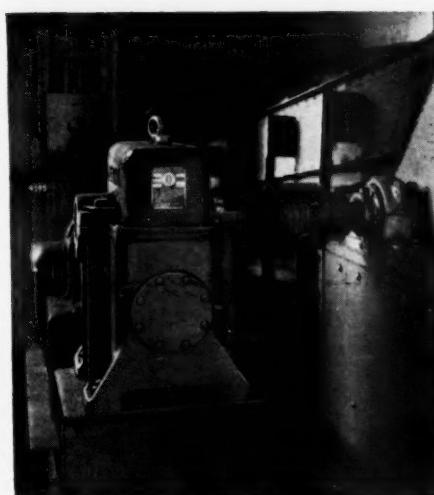
Papers on mechanization, combustion and marketing topics will feature a meeting of the Coal Division of the American Institute of Mining and Mechanical Engineers to be held May 25 at the Kanawha Hotel, Charleston, W. Va. There will be morning and afternoon sessions as well as a banquet in the evening at which C. C. Dickinson, president, National Coal Association, will preside as toastmaster and H. N. Eavenson, president, Clover Splint Coal Co., will speak on "The Aims and Objects of Bituminous Coal Research."

New Preparation Facilities

CLEMENS COAL CO., Mulberry, Kan.: Contract closed with Deister Machine Co. for three Plat-O coal-washing tables for treatment of fine coal with rated capacity of 45 tons of feed per hour; also one single-deck 3x8-ft. Plat-O vibrating screen equipped with fine-mesh screen cloth for dewatering fine clean-coal table product; additions to existing plant; to be completed in May.

CROWE COAL CO., Clinton, Mo.: Contract closed with McNally-Pittsburg Mfg. Corporation for complete washery to handle 350 tons per hour of 6x0-in. coal and classify into four sizes; equipment includes McNally-Norton compound box; to be completed about Aug. 1.

MARRIOTT-REED COAL CO., Columbia, Mo.: Contract closed with McNally-Pittsburg Mfg. Corporation for complete washery and stoker-



UNINTERRUPTED PRODUCTION

your reward for using

DE LAVAL WORM GEARS

By selecting De Laval Worm Gears for the important power drives continuous operation without breakdowns is insured, in spite of severe duty and unfavorable operating conditions, and with only occasional inspection of oil levels. This dependability results both from the use of best quality materials and perfected methods in the production of De Laval Gears and from the expert skill of the De Laval engineers in designing gears for, and fitting them to, the particular conditions under which they are to be operated.

A statement of your speed reducer requirements will be rewarded with pertinent data and well considered advice.

DE LAVAL STEAM TURBINE CO.

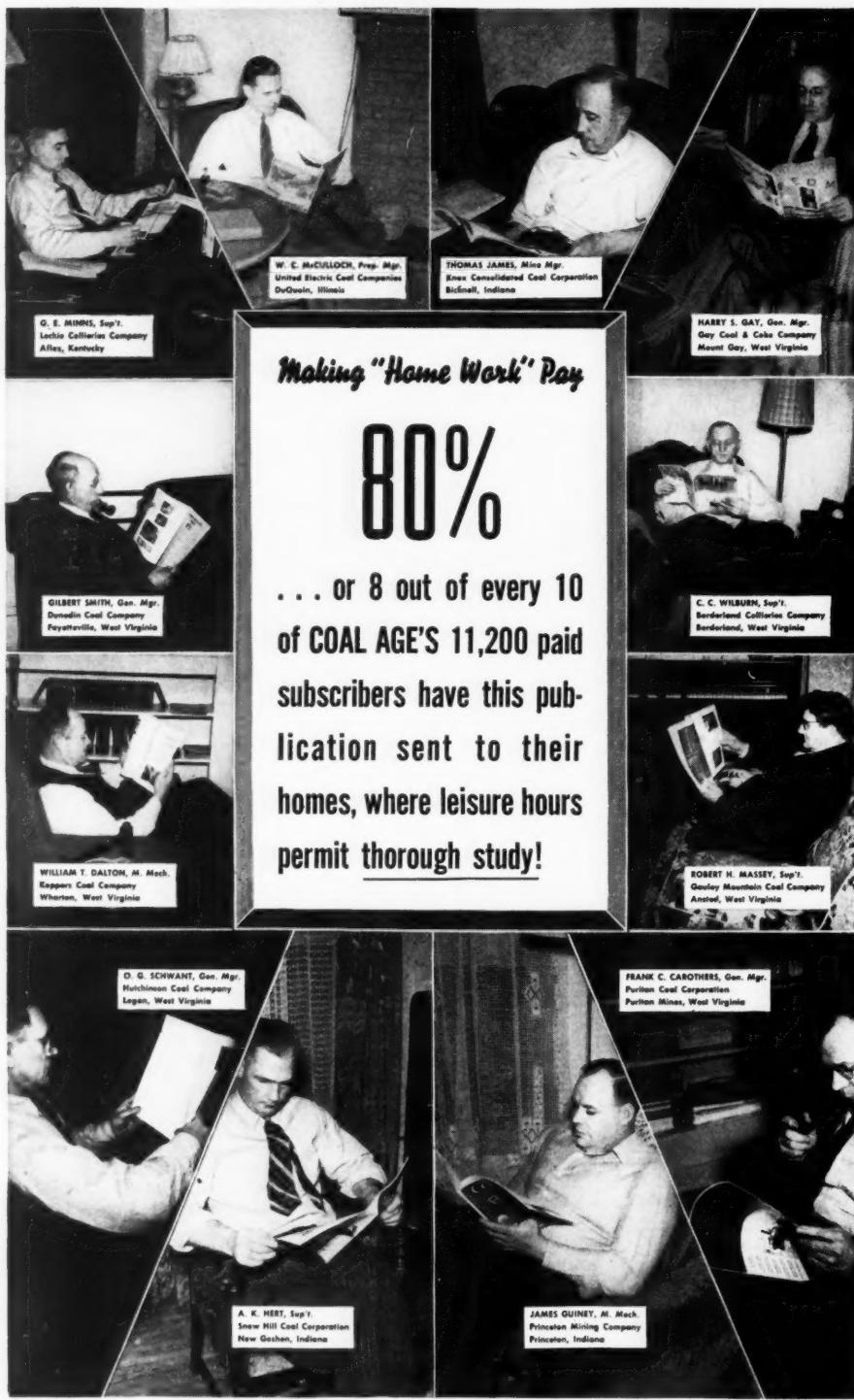
TRENTON, N. J.

1108



Nuts—1,000,000 Years Old?

No, the geologists insist they are fossil impressions of large scars which mark the position of cast-off branches of a tree rejoicing under the name of *Ulodendron* and which grew during the Upper Carboniferous (Pennsylvania) epoch of the Carboniferous period of the Paleozoic era. Or at least something like that. Estimated age, 350,000,000 years, according to the best available data. The two fossils were removed from the Freeburn coal mine of the Wheeling Steel Corporation, Freeburn, Ky.



Making "Home Work" Pay

80%

... or 8 out of every 10
of COAL AGE'S 11,200 paid
subscribers have this pub-
lication sent to their
homes, where leisure hours
permit thorough study!

ADDITIONAL COPIES AVAILABLE

of "130 Cues to Coal-Mining Profits" which
was a supplement to April Coal Age

This chart for study and ready reference wall or desk display shows production for both anthracite and bituminous coal, breakdown of cost per ton of bituminous by regions, amount of mechanically loaded bituminous tonnage and number of units which have been installed, together with the growth of mechanical cleaning in the bituminous industry. "130 Cues to Coal-Mining Profits" also consists of a series of questions to stimulate thought as to the best methods to use in every coal-mining phase from new construction work on through all underground and strip work to preparation-plant practice and refuse disposal.

coal crushing equipment to wash 50 tons per hour of 3x0-in. coal and classify into three sizes; equipment includes McNally-Norton automatic washer; to be completed about July 1.

HARLAN FUEL CO., Yancy, Ky.: Contract closed with Jeffrey Mfg. Co. for screen and conveying equipment for tipple, including primary shaker screens, extensions to loading booms, six Jeffrey-Taylor electric vibrating screens, Jeffrey flextooth crushers, scraper conveyor and elevator; raw-coal feed rate, 400 tons per hour; to be completed July 1.

Smoke Association Convention Plans Nearly Complete

Plans are nearly complete for the 34th annual convention of the Smoke Prevention Association, to be held May 21 and 22 at the Hotel Statler, St. Louis, Mo. According to Frank A. Chambers, chief smoke inspector of Chicago and secretary of the association, the attendance bids fair to outstrip all previous turnouts.

There will be addresses by Reinhard Kunz, president of the association; Mayor Bernard F. Dickmann of St. Louis; W. E. E. Koeppler, secretary, Pocahontas Operators' Association, and R. R. Tucker, St. Louis Smoke Commissioner, and the following papers will be presented: "Smoke Index: A Quantitative Measurement of Smoke," Robert J. Piersol, Illinois State Geological Survey, and "The Law as Applied to Air Pollution," Ralph Johansen, president, Hays Institute of Combustion. An outstanding feature will be a panel discussion on "Hand-Firing Heating Equipment With Different Kinds of Coal," in which the following will participate: D. H. Williams, district manager, Coal Bureau, Norfolk & Western Ry., Cincinnati, Ohio; J. E. Tobey, manager, fuel engineering division, Appalachian Coals, Inc.; Vernon Leach, combustion engineer, Peabody Coal Co.; George Ritchie, fuel service engineer, Chesapeake & Ohio Ry.; and Stewart Orgain, consulting engineer, Chicago Coal Merchants' Association.

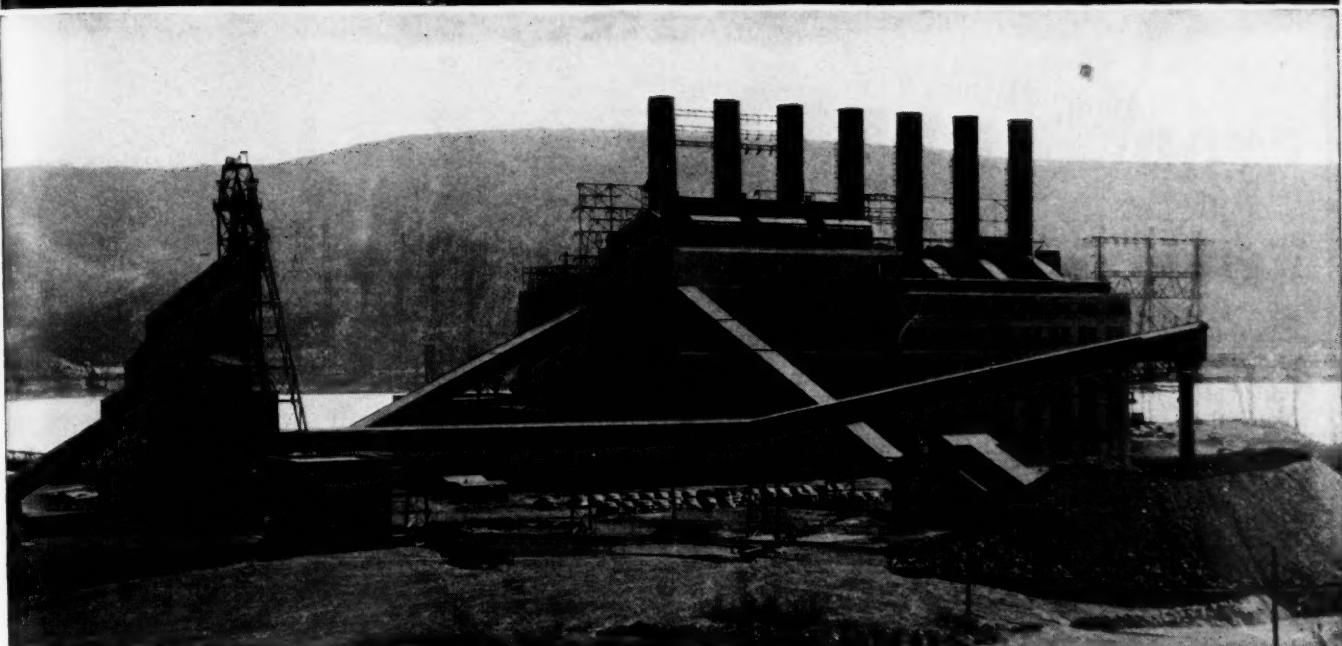
William G. Christy, smoke abatement engineer, Hudson County, New Jersey, will act as chairman during a panel discussion on "Railroad Smoke Abatement." H. K. Kugel, chief engineer, Division of Smoke Regulation and Boiler Inspection, Washington, D. C., will preside over a conference of city smoke inspectors.

U. M. W. Wins Again in Kentucky

The National Labor Relations Board has certified the United Mine Workers as bargaining agency for employees at the mining operations of the Norton Coal Corporation, Nortonville and Illsley, Ky. Election ordered by the Board resulted as follows: 80 for the U.M.W. against 66 for the Progressive Mine Workers.

In a special election supervised by the N.L.R.B., a majority of employees of the Paragon Elkhorn Coal Co., Dunleary, Ky., favored the U.M.W. as a bargaining agency. S. B. McIntyre, president of the company, reported that 131 workers cast votes in favor of the U.M.W., 23 chose the Dunleary Employees' Association (independent), and 2

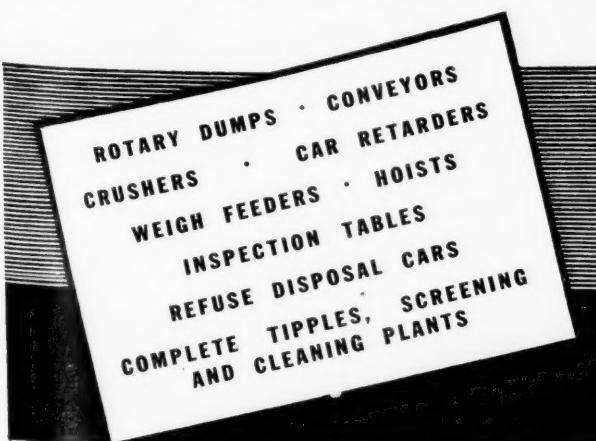
COAL HANDLING



From Shaft Bottom to Station Bunkers *Heyl & Patterson* all the way



COAL HANDLING SYSTEM at Springdale Station of West Penn Power Company, designed, fabricated and erected by Heyl & Patterson.



HEYL & PATTERSON INC.

50 WATER STREET PITTSBURGH, PA.

STOP Weight Losses

Control costs and safeguard your profits with rapid, accurate weighing! Valuable new Howe Scale folder illustrates the latest models of modern weighing machines, ranging from 1/64 oz. to 300 tons, developed from more than eighty years' accumulated experience. Write for it today. The Howe Scale Company, 105 Scale Ave., Rutland, Vermont.

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MINE SCALES AND
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FAMOUS FIRST IN 1857

MESCO INSULATOR SWITCHES



for LONGER SERVICE . . . MORE EFFICIENCY

Mesco Trolley Section Insulator Switches are ruggedly designed to stand up under severe service encountered in coal mines. Yet they are built with great precision, for safety and efficiency in use. Constructed of high quality bronze, they are available in all types and sizes, for use with any size trolley wire or feeder cables. The switch blades are easily interchangeable, for right or left hand. Write for complete information.

Mosebach manufactures a complete line of Track and Trolley Products, including: RAIL BONDS and MESCO WELDING MACHINES, TROLLEY SWITCHES, FROGS, SPLICERS, WHEELS, POLEHEADS, HARPS, GLIDERS, and GROUND CLAMPS. PROMPT SERVICE GUARANTEED!

MOSEBACH
ELECTRIC & SUPPLY COMPANY
1115 Arlington Avenue Pittsburgh, Pa.

expressed no preference. The mine had been closed for several months because of labor difficulties.

In another decision the Board ordered the Providence Coal Mining Co., Providence, Ky., to cease and desist from discouraging membership by its employees in the United Mine Workers or any other organization of their own choosing. The company also was directed to reinstate three employees and to reimburse them for wages lost in consequence of their discharge.

Rocky Mountain Program Shaping

Under the chairmanship of F. W. White-side, secretary-treasurer of the institute, the program committee is hard at work in preparation for the annual meeting of the Rocky Mountain Coal Mining Institute, to be held June 6-8 at the Cosmopolitan Hotel, Denver, Colo. A program designed to be interesting as well as instructive is being planned, with papers on subjects of a timely nature.

Besides a banquet, with the best entertainment obtainable, the committee aims to provide a trip to one of the new mines in the field north of Denver as well as a visit to a large manufacturing plant. Other members of the program committee are: C. M. Schloss, H. C. Marchant, B. A. Franklin, E. C. Horne and S. M. L. McSpadden.

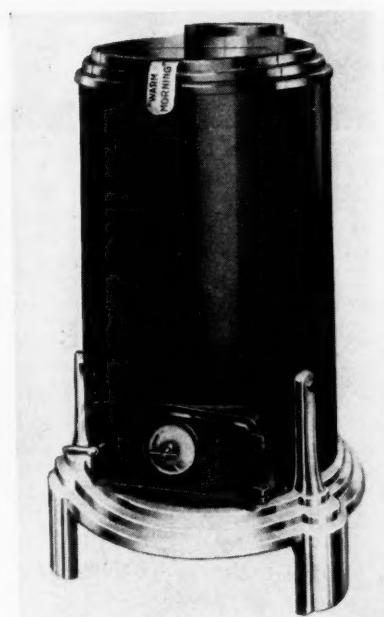
W.V.U. Announces Short Course

The 28th annual short course in coal mining sponsored by the West Virginia University School of Mines and the Vocational Division of the State Department of Education will be held this year from June 10 to July 20. The course, which lasts six weeks, will be held at the university, Morgantown; Mount Hope High School, and Welch High School. The subjects to be covered include: study and discussion of the State mine laws, mining arithmetic, explosives, electricity, drawing, mine gases, methods of mining, mine fires and explosions, drainage and pumping, timbering, mine foremanship, safety lamps, mine ventilation, and haulage. The course has two purposes: to help mining men obtain certificates of competency as mine foremen or firebosses and to give each man a thorough knowledge of safe and efficient mining together with information on newly developed methods and practices.

New Coal Stove Patented

A new coal heating stove said by its inventor to assure warm mornings regardless of the weather has been patented by Sam P. Locke, of Mexico, Mo. Coal operators, including the Sinclair Coal Co., have become interested with announcement that the new stove is to be put into quantity production in Kansas City, Mo. It will burn hard or soft coal, coke, or even wood. Among advantages claimed by the inventor are: semi-automatic magazine feed; maintains steady even heat, holding fire 12 to 24 hours in coldest weather—several days in mild weather—without attention.

Having a modernistic exterior, the inside



"Warm Morning" stove

construction is a patented arrangement of firebrick and heavy cast iron. The outside jacket is 20-gage blue polished steel. The trim is chrome and enamel. It has machine-ground ash door fitted paper-tight and shake draw-center grate. The 20-in. size, now being manufactured, is said to have sufficient heating capacity for the average living room, dining room and bedroom.

Sterling Tipple to Be Rebuilt

Sterling Coal Sales Corporation, Cleveland, Ohio, is considering bids for a new tipple, including shaker screens, loading boom and a 30x30-in. coal crusher, to be erected at the Sterling mine, Salineville, Ohio. The new structure, which is to be in operation by July 1, will replace the plant destroyed by fire on March 26, entailing a loss of \$30,000. A temporary tipple has been erected and the mine is again operating.

Sales Students Get Diplomas

Sixty-five graduates received "diplomas" on April 4 for having completed the second annual sales training program of eight weeks provided for Koppers coke dealers and their representatives in Philadelphia, Pa. The training period was sponsored by the Philadelphia Coke Co., which also acted as host to the students at a banquet in the Bellevue-Stratford Hotel. Sales people representing 44 dealers finished the course to be graduated.

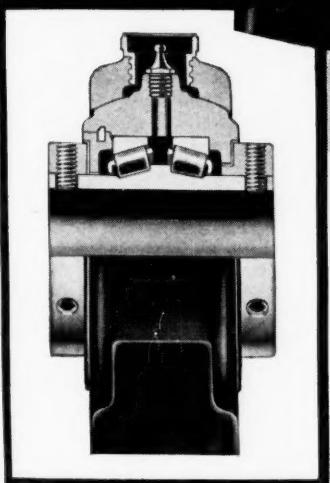
Tierneys Operate Premier Mine

A majority of the outstanding stock of the Premier Pocahontas Collieries Co., Premier, W. Va., has been purchased by the Tierney interests, which have assumed management and operation of the property. Stockholders have elected the following new officers: president, Lewis C. Tierney; vice-president, George B. Baker; secretary-treas-

AGAIN THIS WINNING TEAM SCORES!

DODGE

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With The New Dodge-Timken Double Interlock Roller Bearing!

The latest addition to the Dodge-Timken Pillow Block line is another outstanding example of the excellent results obtained when a specialist like the Dodge Manufacturing Corporation concentrates its experience, ability and resources on such a problem.

Dodge-Timken Double Interlock Type Pillow Blocks meet a definite need in modern power transmission. They are especially designed for quick and easy application on ordinary commercial shafting where the loads to be carried are not as heavy as those requiring use of the Dodge-Timken Clamp Sleeve Type Pillow Block.

Their fundamental operating characteristics are the same as those of all Timken Bearing Equipped power-transmission equipment—smoothness; steadiness; prevention of power waste; radial, thrust and combined load capacity; freedom from wear; and greatly simplified lubrication.

When buying new transmission units of any type make sure they have TIMKEN Roller Bearings. Then you will be sure of getting a full measure of dependability and economy.

TIMKEN TAPERED ROLLER BEARINGS

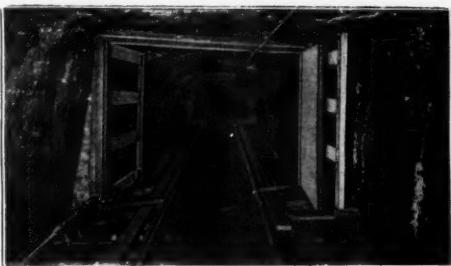
Manufacturers of TIMKEN Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; TIMKEN Alloy Steels and Carbon and Alloy Seamless Tubing; and TIMKEN Rock Bits.



MILES OF
SMILES ON
TIMKEN BEARINGS

THE TIMKEN ROLLER BEARING
COMPANY, CANTON, OHIO

Canton Automatic Mine Doors Improve Ventilation in Any Mine



Evidence is convincing that greater efficiency in the control of circulation and velocity of the air is secured through the use of Automatic Mine Doors.

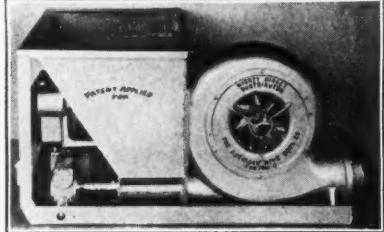
Following every disastrous mine explosion, deficient ventilation has been found to have been a contributing cause.

Your mine properly ventilated and thoroughly rock dusted is safe from disastrous dust explosions.

NOW IS THE TIME TO ORDER YOUR ROCK DUSTING MACHINE

THE MIGHTY MIDGET is a marvelous little machine that puts on as much dust as many large machines.

Costs less than \$500. 25 types of large machines to meet every requirement.



Delay May Mean the Loss of Your Mine

SEND FOR CATALOG

**AMERICAN
MINE DOOR CO.**

2057 Deuber Ave. Canton, Ohio

*For a SAFE, PROFITABLE
INVESTMENT, choose—*



Here's an example of superior engineering design and construction inherent in the entire Deister Concentrator line — the Leahy Type "C" No-Blind Vibrating Screens with TRI-VIBE.

For fine screening operations, the Leahy's free-swinging screen jacket, triple powered with the dynamic Leahy differential vibration, assures low-cost screening, with increased capacity and uniformity.

Put these advantages to work for you. Detailed information on request. Write today.

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THE ORIGINAL DEISTER CO.
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FOR SAFETY'S SAKE, SUPERIOR COUPLINGS



Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS



**PITTSBURGH
KNIFE & FORGE CO.**
Park Building
PITTSBURGH, PENNSYLVANIA

urer, L. E. Tierney, Jr.; assistant secretary-treasurer, Mrs. Laurence E. Tierney.

The Premier properties comprise leasehold and fee lands of about 4,000 acres all underlaid by the Welch seam, as well as the Pocahontas Nos. 4 and 3 seams below water level. With this acquisition, in addition to the Tierney Mining Co. and the Eastern Coal Corporation, the annual output of Tierney properties totals about 3,000,000 tons.

Wage Increases Recommended For Cape Breton Miners

A conciliation board appointed to inquire into a dispute between the Dominion Coal Co. and the Cumberland Railway & Coal Co. and their employees on Cape Breton Island, N. S., unanimously recommended wage increases for the lower brackets of data workers and for contract workers on the longwall face in Cumberland No. 2 colliery, at Springhill, Labor Minister J. L. McLarty announced on March 26. The increases would be retroactive to Feb. 1, 1940, and remain in effect until Jan. 31, 1941. The company agreed to accept the report and make the increases effective immediately on advice from United Mine Workers executives that they were willing to accede.

Estimated cost to the company, which with associated companies provides means of livelihood for between a fifth and a quarter of the total population of Nova Scotia, was placed at \$150,000. Increases for data workers range from 3 to 19c. a day, while the hand-pick contract workers in No. 2 colliery would get an increase from 55.7 to 62c. per ton. Formal reference of the board applied only to the Dominion company, but workers with the Cumberland company, its subsidiary, submitted that the reference should be extended to it.

Expiration of the agreement on Jan. 31 brought about appointment of the board. Justice C. P. McTague, of the Ontario Supreme Court, was chairman, with Prof. Frank Scott, McGill University, representing the employees, and Ralph P. Bell, Halifax, representing the company.

Industrial Notes

STEWART-WARNER CORPORATION, Chicago, has appointed Ernest N. Robinson to the newly created position of assistant sales manager of the accessory division. These new distributors have been appointed: Auto Electric & Service Corporation, Detroit, Mich.; Nippert Electric Products, Columbus, Ohio; Toledo Auto Electric Co., Toledo, Ohio.

RELIANCE ELECTRIC & ENGINEERING Co., Cleveland, Ohio, has elected James W. Corey as sales vice-president. He has been with the company 29 years, since 1932 as general sales manager.

DE LAVAL STEAM TURBINE Co., Trenton, N. J., has appointed the J-B Sales Engineering Co., New Haven, Conn., as Connecticut engineering representative for its worm gear division.

SIMPLEX WIRE & CABLE Co., Cambridge,

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May,

The Importance of an Adequate Safety Factor* For Your Wire Rope

*The Safety Factor of a rope is the number of times the rope is stronger than the load.

Engineers explain it as "the ratio between the rated breaking strength of the rope and the load applied to the rope."

A wire rope operated with an inadequate Safety Factor is like a small man lifting a very heavy load. He may do it successfully for a period of time—but eventually he'll strain a muscle or receive a permanent injury which may shelve him for life. That kind of operation is costly. Make sure you have an adequate SAFETY FACTOR for ropes on all your loads.

HOW TO FIGURE: If a crane (having a single part line) is equipped with a rope having a breaking strength of 12 tons, and is required to lift a load weighing two tons, the Safety Factor of the rope is 6—adequate in this case (see Illustration and Table).

If the rope were required to handle a 3-ton load the Safety Factor would then be only 4—too low for safe, economical operation (see Illustration and Table).

THE VALUE OF AN ADEQUATE SAFETY FACTOR—

By allowing an adequate Safety Factor for all ropes, safe operation of your equipment is assured, longer, lower cost service is obtained from the rope. Here's why:

1. Overloading is prevented.

The ability of wire rope to withstand bending or fatigue decreases rapidly when loaded too heavily. This is one of the greatest causes of rope failure.

2. Service life is increased.

With a high factor of safety the pressure per square inch between the rope and sheave or drum (or other object along the path of rope travel) is less, thereby reducing the rate of wear. A wire rope with a Safety Factor of 6 will last approximately twice as long as the same rope operating with a Safety Factor of 3.

3. Safety in operation is increased.

A high initial safety factor in the rope means that after its strength is reduced by wear or broken wires that a greater reserve strength remains. This means greater protection against accidents to men and machinery.

This is NO. 4 IN A SERIES of informative articles for wire rope users prepared by the Macwhyte Wire Rope Company

AVOID COSTLY AND DANGEROUS OVERLOADING

... Make Sure You Have An Ample Safety Factor

RIGHT



WRONG



This represents safe, profitable practice for a crane rope.

This represents dangerous, costly practice. Safety Factor is too low.

Type of Service	Minimum Safety Factor
MINIMUM SAFETY FACTORS	
Guys—Derricks	5
" —Stacks	3.5
Shovels, Cranes, Excavators	5
Overhead Traveling Cranes	6
Hot Ladle Cranes	8
Electric and Air Hoists	7
Track Ropes	4
Derricks	6
Mine Shafts—Up to 500' deep	8
500' to 1000' deep	7
1000' to 2000' "	6
2000' to 3000' "	5
Over 3000' "	4
Passenger Elevators—	
Car Speeds 250' per min.	9
500' " "	10.25
800' " "	11.25
1000' " "	11.6
Miscellaneous Hoisting Equipment	5

NO. 463

MACWHYTE ENGINEERS are always at your service to recommend the correct ropes for your needs.

Copies of this and previous articles on how to get the most out of your wire rope are available. Send us your name and title on company letter-head and copies will be sent you without obligation.

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Kenosha, Wisconsin. Manufacturers of PREformed, Internally Lubricated, Laboratory-Tested and Field-Proved Wire Rope—and Braided Wire Rope Slings.
New York . . . Pittsburgh . . . Chicago . . . Ft. Worth . . . Portland . . . Seattle . . . San Francisco.
(Distributors throughout the U. S. A.)



Mass., has elected Henry A. Morss, Jr., as a vice-president.

GENERAL ELECTRIC CO., Schenectady, N. Y., has named Chester H. Lang as manager of apparatus sales and vice-chairman of the company's apparatus sales committee. He had been manager of advertising and sales-promotion activities since 1932. Robert S. Peare, president and general manager of the Maqua Co., a large printing and engraving concern affiliated with G.E., has been named to succeed Mr. Lang as manager of the publicity department.

FALK CORPORATION, Milwaukee, Wis., announces the following changes in executive personnel: Edward P. Connell, treasurer, has assumed the newly created post of general manager. Walter L. Schneider succeeds Matthew A. Carpenter as sales manager in charge of active sales of all Falk products except those covered by the foundry division. Mr. Carpenter, who is secretary of the

corporation, will continue in a supervisory capacity over the sales, sales promotion and advertising departments.

CATERPILLAR TRACTOR CO., Peoria, Ill., has elected as vice-presidents J. D. Fletcher, export sales manager, and T. R. Farley, assistant to the president.

LINK-BELT SPEEDER CORPORATION, shoveldragline-crane manufacturer, Chicago, has appointed Hayes Parsons as sales manager. For the last several years he has represented the Speeder Machinery Co. and (since the consolidation) Link-Belt Speeder in the Seattle (Wash.) district.

PRODUCTIVE EQUIPMENT CORPORATION has moved its office and manufacturing plant to 2926-8 West Lake St., Chicago.

CLEVELAND TRAMRAIL ERIE CO., distributor of Cleveland Tramrail overhead materials-handling equipment in Erie, Pa., and adjacent territory, has moved to 1731 Oxford St., Erie.

LINK-BELT CO. announces that its stoker division's sales and service quarters in Detroit, Mich., have been moved to 2885 East Grand Boulevard, with James C. Cunningham in charge.

AIR REDUCTION CO., New York City, has appointed John C. Crowe as assistant to Herman Van Fleet, vice-president and operating manager. Mr. Crowe will continue to direct the activities of the apparatus research and development department and coordinate these with similar activities for Wilson Welder & Metals Co., Inc. H. E. Landis, Jr., formerly assistant to Mr. Crowe, has been appointed manager of the apparatus research and development department. C. G. Andrews has been appointed manager of gas plants.

ROBINS CONVEYING BELT CO. has moved its main office to Passaic, N. J., where a new three-story building will house its executive, engineering, sales and other departments. A sales office will be maintained in New York at 70 Pine St.

ELECTRIC STORAGE BATTERY CO., Philadelphia, Pa., has appointed Roland Whitehurst assistant general sales manager with headquarters in the home office. He has been with the company since 1908, the last 20 years as manager of the Washington (D. C.) branch. He has been succeeded in the latter post by J. A. Klingensmith, hitherto a member of the local sales staff.

R. G. LETOURNEAU, INC., Peoria, Ill., announces that George McNutt has returned to the company as advertising manager, succeeding George R. Huffman, who resigned.

CHAIN BELT CO., Milwaukee, Wis., has appointed Thomas E. Crocker as manager of its Detroit (Mich.) district sales office, vice G. A. Gunther. Mr. Klemme succeeds Mr. Crocker as manager of the Buffalo (N. Y.) district office. Robert Potter, of the home office sales staff, has been transferred to the Pittsburgh (Pa.) office, where he will assist Gayle Sherratt, district manager.

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numerous and widely varied welding purposes.

AUTOMATIC COAL SAMPLERS—Thorsten Sampler Co., Pittsburgh, Pa. Bulletin P-6 explains the principle of the Thorsten sampling system, also describing the design and operation of the sampler and sampling crusher.

CENTRIFUGAL BLOWERS AND COMPRESSORS—DeLaval Steam Turbine Co., Trenton, N. J. Catalog F covers construction of centrifugal blowers and compressors and their characteristics; turbine and motor drives; governing; properties of gases and laws of compression; selecting a compressor for given conditions and calculating the horsepower, and calculating pressure drop in piping.

CHEMICALS—Glyco Products Co., Inc., New York City. Catalog describes glycol and glycercyl esters, emulsifying agents, special emulsions, synthetic waxes, synthetic resins and a number of specialties of wide application.

CUTTING EQUIPMENT—Frank Prox Co., Inc., Terre Haute, Ind. Circular 340 cites the advantages of Prox ToolSteel bits and chains.

DEEPWELL WATER SYSTEMS—Turbine Pump Division of Roots-Connersville Blower Corporation, Connersville, Ind. Bulletin 260-B15 covers the R-C Auto-Jet line of systems.

ELECTRICAL EQUIPMENT—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Booklet B-2224, describing equipment, materials and supplies for coal mining, is subdivided into sections on electrical power distribution; mining and preparative equipment; transportation and power transmission; maintenance and repairs. Booklet 32-100 covers metal-enclosed switchgear, including indoor metal-clad, indoor and outdoor oil-filled metal-clad, horizontal draw-out truck and cubicle types. Catalog 30-000 is prepared especially for users of electrical equipment to facilitate selection of the correct apparatus for any motor, lighting or feeder circuit.

HOISTS, WIRE-ROPE FASTENING—American Hoist & Derrick Co., St. Paul, Minn. Bulletin 100-H-O features the new Model 20 American general-purpose hoist. Catalog CCB-13 describes the Crosby clip for fastening wire rope in every kind of service.

MATERIALS HANDLING—Lewis-Shepard Sales Corporation, Watertown, Mass. Catalog 21 covers more than 175 items including many types of lift trucks, floor trucks, portable elevators, cranes, storage racks, skid platforms, equipment for specific purposes, and many new machines designed for use in modern techniques of materials handling.

MINING AND INDUSTRIAL EQUIPMENT—Ohio Brass Co., Mansfield, Ohio. Catalog 22 describes the company's large and varied line, giving complete engineering data and other information, with illustrations.

MOTORS—General Electric Co., Schenectady, N. Y. Bulletin GEA-1413B stresses advantages of G-E vertical solid-shaft induction motors. Bulletin GEA-1368D cites features of vertical hollow-shaft induction motors.

PORTABLE COALING STATIONS—Jeffrey Mfg.



THE POST-GLOVER ELECTRIC CO.

ESTABLISHED 1892
221 WEST THIRD STREET, CINCINNATI, OHIO

OSMOSE NATURAL PRESSURE TREATMENT

Increases Service Life of Mine Timbers and Ties At Least
3 to 5 Times!



Osmose-treated oak posts and cross-collars used for roof timbering in Harlan Collieries Co. mine at Brookside, Ky.

Without the use of any pressure—or heat-treating equipment whatever, you can lengthen the life of your mine timbers and ties by preventing decay the Osmose way!

—application of Osmose preservatives is as simple as applying whitewash.

—you can cut and treat your ties and timbers yourself, or buy them in the vicinity of your mine.

—use any species of wood; Osmose-treated non-durable woods outlast untreated durable woods many times over.

—Osmose treatment costs only a fraction of pressure treatment, yet penetration and effectiveness of preservatives is conclusively established by authoritative reports from recognized laboratories and experience of prominent users.

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General Offices: 1437 Bailey Ave., Buffalo, N. Y.
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Portables TRACK TACKLE



OPENS EYES AT CINCINNATI

Hundreds of delegates to the recent American Mining Congress were surprised at the completeness and quality of Portable's Track Tackle Line.

Each one of Portable's Haulage Safety Devices is the result of intense research by our engineers, in a genuine effort to lower the number of haulage accidents. Each item is built to Portable standards.

Find out about these Portable products. They can lower your accident rate, increase efficiency in your mine. Write for literature on any of these items.

The Portable Track Tackle Line includes: (A) Switch Signals; (B) Car Stops; (C) Holding Skids; (D) Running Skids; (E) Derailers; (F) Rail Splicers; (G) Transition Rails.

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Portable Lamp & Equipment Co.
72 FIRST AVENUE PITTSBURGH, PA.

Cool Caps and Hats Electric Cap Lamps Safety Lamps
Safety Shoes Goggles Respirators



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There are many plus-profit features incorporated in the design and construction of the Simplicity Screens. This is one of the reasons why our users report six, eight and even ten years of service without any major maintenance expense. Every installation of Simplicity Gyration Screens is guaranteed as to results.

WHY GAMBLE?

Simplicity
ENGINEERING COMPANY
DURAND, MICHIGAN

Co., Columbus, Ohio. Bulletin 728 points out advantages of three arrangements of portable railroad coaling stations to meet various conditions which, by bringing the coaling station to the locomotive, greatly increase locomotive efficiency.

SAFETY EQUIPMENT—Boyer-Campbell Co., Detroit, Mich. Catalog 40 lists equipment for use in various industries, taking in every phase of the safety problem.

SAFETY GOGGLES—American Optical Co., Southbridge, Mass. Bulletin contains rules on care of safety goggles whereby they will be kept in perfect order, providing more efficient eye protection for workers.

SHAKER CONVEYORS—La-Del Conveyor & Mfg. Co., New Philadelphia, Ohio. Bulletin 109 points out features and advantages of the company's one-way and reversible-motion cushion-drive units including shaker drives and conveyor line accessories for every condition; gathering and room-type belt conveyors; room- and face-type flight conveyors; loaders, loading heads and portable blowers.

STEEL—Republic Steel Corporation, Cleveland, Ohio. Catalog on double-strength steel, a high-tensile low-alloy product, contains information on: how and why the product was developed; resistance to corrosion and fatigue; fatigue limits; welding qualities; service records; fabrication, incorporating data on cold and hot forming, deep drawing, riveting, machining, gas cutting, gas and electric welding; and forms in which the material is available.

STRAIN CLAMP, INSULATED CLEVISSES—Ohio Brass Co., Mansfield, Ohio. Bulletin 693-H

describes, illustrates and gives complete catalog information on the company's intermediate size of universal strain clamp which accommodates 0.188- to 0.437-in. conductors. Bulletin 688-H gives similar information on three sizes of O-B spools, including one for standard secondary rack use, and four types of insulated clevis assemblies using these spools.

TRANSPORTATION EQUIPMENT—Sanford-Day Iron Works, Knoxville, Tenn. Folder Form 1255-K emphasizes the simplicity, convenience and other advantages of S-D automatic bottom-discharge trailers.

Soft-Coal Accident Fatality Rate Dips; Up Slightly for Hard

Accidents at coal mines of the United States caused the deaths of 68 bituminous and 16 anthracite miners in February last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors. With a production of 39,270,000 tons, the accident death rate among bituminous miners was 1.73 per million tons, compared with 2.00 in the corresponding month of last year.

The anthracite fatality rate in February was 4.51, based on an output of 3,544,000 tons, against 4.20 in February, 1939.

For the two industries combined, the accident fatality rate in February last was 1.96, compared with 2.24 for the second month a year previous.

Fatalities during February last, by causes and States, as well as comparable rates for the first two months of 1939 and 1940, are shown below:

UNITED STATES COAL-MINE FATALITIES IN FEBRUARY, 1940, BY CAUSES AND STATES

	Underground						Open-Cut and Surface					
	Falls of Roof	Falls of Face	Haulage	Explosives	Electricity	Machinery	Total Underground	Mine Cars	Railway Cars	Other Causes	Total Surface	Grand Total
Alabama	3	1	1	1	1	1	5	1	1	1	1	5
Arkansas	2	1	1	1	1	1	4	1	1	1	1	4
Colorado	1	1	1	1	1	1	4	1	1	1	1	4
Illinois	2	1	1	1	1	1	2	1	1	1	1	2
Indiana	1	1	1	1	1	1	2	1	1	1	1	2
Iowa	1	1	1	1	1	1	2	1	1	1	1	2
Kentucky	3	1	1	1	1	1	6	1	1	1	1	6
Maryland	1	1	1	1	1	1	1	1	1	1	1	1
Montana	1	1	1	1	1	1	1	1	1	1	1	1
New Mexico	1	1	1	1	1	1	1	1	1	1	1	1
Ohio	1	1	1	1	1	1	1	1	1	1	1	1
Pennsylvania (bituminous)	8	6	1	1	1	1	15	1	1	1	1	16
Virginia	1	1	1	1	1	1	2	1	1	1	1	2
West Virginia	12	6	1	2	1	1	21	1	1	1	1	21
Total (bituminous)	36	1	18	3	3	4	65	1	1	2	3	68
Pennsylvania (anthracite)	7	6	1	1	1	1	13	1	1	2	3	16
Grand total	43	1	24	3	3	4	78	1	1	4	6	84

FATALITIES AND DEATH RATES AT UNITED STATES COAL MINES, BY CAUSES*

January–February, 1939 and 1940

Cause	Bituminous				Anthracite				Total			
	1939	1940	1939	1940	1939	1940	1939	1940	1939	1940	1939	1940
Underground:												
Falls of roof and coal	79	94	1,137	1,116	26	16	2,914	1,746	105	110	1,339	1,178
Haulage	27	34	.388	.404	2	12	.224	1,309	29	46	.370	.493
Gas or dust explosions:												
Local	2	3	.029	.036	1	1	1	1	2	3	.025	.032
Major	91	1	1.081	1.081	8	1	.109	8	91	1	1	.975
Explosives	6	1	.071	.071	1	1	.112	12	7	102	.075	.053
Electricity	11	5	.158	.059	1	1	.112	12	5	153	.051	.075
Machinery	4	7	.058	.083	1	1	4	7	1	1	.051	.075
Shaft	1	1	.014	.014	2	2	.224	3	1	1	.038	.043
Miscellaneous	2	4	.029	.048	3	3	.336	5	4	64	.025	.032
Stripping or open-cut	1	1	.014	.011	1	2	.112	218	2	2	.025	.032
Surface	6	8	.086	.095	3	2	.336	.218	9	10	.115	.107
Grand total	133	253	1,913	3,004	46	33	5,155	3,600	179	286	2,282	3,063

*All figures subject to revision.

WHAT'S NEW IN COAL-MINING EQUIPMENT

IMPROVED SAFETY GOGGLE

All its Ful-Vue Safety goggles, American Optical Co. announces, will soon be supplied with a new improved bridge and range of three eye and three bridge sizes.

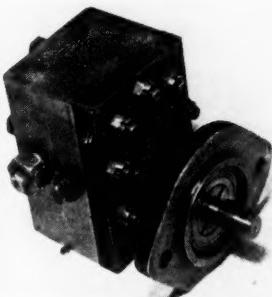
The new double-braced bridge, soldered at four places (instead of the conventional two) to the lens frame is a sturdy design. It is asserted that the added rigidity from the greater bearing surface of the bridge on the lens frame will keep the goggles in proper adjustment longer, under strenuous daily handling and even under impact. Also, the modern styling and decorative milling of the bridge definitely improve the appearance.

To obtain more exact fitting the goggles will be supplied in three eye sizes (44, 47 and 50 mm.) and three bridge sizes (21, 23 and 25 mm. between lenses).



PRESSURE PUMP

A heavy-duty pressure pump is announced by Mining Machine Parts, Inc., Cleveland, Ohio. Its design is said to combine ruggedness with fewer oper-



ating parts, for severe duty in mining and other hydraulically actuated equipment. The manufacturer reports favorable results from field operating tests.

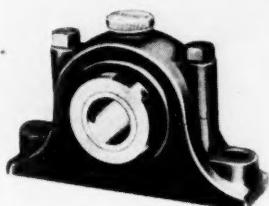
PORTABLE LOADER

A new portable loader for handling all sizes of coal and coke is offered by the Jeffrey Mfg. Co., Columbus, Ohio. Designed to load from railroad cars to ground storage or direct to truck, it also will load 4-in. cube

PILLOW BLOCK

The new Dodge-Timken double interlock pillow block, offered by the Dodge Mfg. Corporation, Mishawaka, Ind., is designed for simplified mounting on ordinary commercial shafting where lighter loads are to be carried than those requiring the Dodge-Timken clamp sleeve type of bearing. The new unit uses a special duplex Timken roller bearing with long extended inner race-ring extending completely through the housing to provide a completely inclosed bearing.

The pillow block is made in both expansion and non-expansion types. In the non-expansion type the inner unit is mounted in a two-piece cast-iron housing with the inside machined truly spherical to fit the outside of the inner unit. In the expansion type, the inner unit is mounted in a two-piece cast-iron outer housing with the inside ma-



chined with a straight cylindrical bore to fit the outside of the inner unit. Adequate labyrinth seals are provided to retain lubricant and to protect bearing against foreign materials.

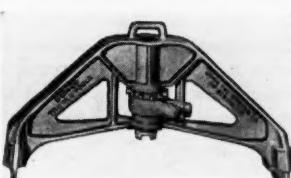
WEDGE-WIRE SCREEN

A new improved wedge-wire screen, known as the Tru-Slot, is offered by the Wedge-Wire Screen Co., New York City. A new form of assembly eliminates the loops of old type screens; special wire profiles have been devised to minimize blinding and clogging through capillary attraction in the slots. The slot width is determined by spacers which are said to maintain slot uniformity indefinitely; slot widths as fine as 0.001 in. can be obtained.

These screens can be supplied with a continuous slot for maximum efficiency in certain types of drying, solids recovery from liquids, screening and filtering. Drainage may be effected by means of side bars or angles protruding below the screen, serving also for fixation. The screens are made not only in flat form but also to any shape or curvature; any width or length may be had. Any American alloy may be specified, such materials as stainless steel, Monel metal, bronze, brass, duralumin, etc., being used.

HEAVY-RAIL BENDERS: GREASE GUN

Gibraltar Equipment & Mfg. Co., St. Louis, Mo., has developed both ratchet- and standard-type rail benders said to be capable of bending and straightening 80- to 120-lb. rail. According



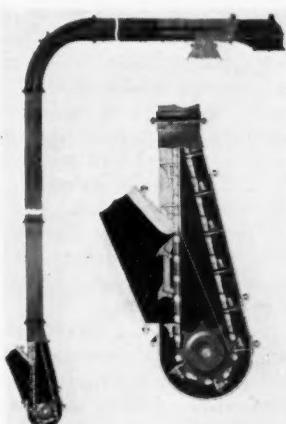
to the manufacturer, the new units are of the same quality, portability, safety and light weight as the benders for use with lighter rails.



The Friction Doctor grease gun, for pneumatic high-pressure lubrication, also offered by Gibraltar, is designed to develop 6,000 to 10,000 lb. of pressure to break through frozen bearings and gummed-up fittings. With a tank holding 20 lb. of grease, it works easily and rapidly, being operable with one hand. It also is light, easy to carry and simple in construction.

MASS-FLOW CONVEYOR

Jeffrey Mfg. Co., Columbus, Ohio, announces that its Mass-Flo elevator-conveyor offers a new low-cost means of handling a wide variety of materials. With a single unit it conveys material in a horizontal, vertical or inclined direction. Simple in design and construction, it consists of a steel casing through which solid pivoted flights spaced at intervals on a single strand of chain move the material in a solid mass or column. So gentle

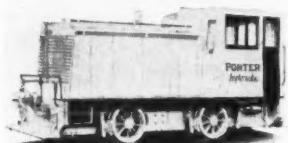


is the action that there is little or any agitation of the material, minimizing breakage or degradation.

DIESEL-HYDRAULIC LOCOMOTIVE

The new diesel-hydraulic-drive industrial locomotive recently introduced by H. K. Porter Co., Inc., Pittsburgh, Pa., is powered by a Hercules diesel engine, in which, mechanically, there is no connection between the diesel engine and the driving wheels of the locomotive. All of the power required for operation is transmitted by means of fluid drive; no friction clutches or other conventional methods of connection are employed.

The operating liquid is a light mineral oil supplied by small pump driven from the transmission shaft. Proper distribution of the oil is made to the various hydraulic circuits actuated by a control device. The locomotive is said to be simple to operate and the application of power to the driving wheels smooth and continuous. All shafts are mounted on roller bearings. Need for gear shifting for speed changes is eliminated since the necessary changes



are made automatically at advantageous points. This locomotive is said to be the first one built in the United States using the Voith turbo transmission. The engine is Model DHXB, a six-cylinder diesel of 5-in. bore and 6-in. stroke.

SHOTFIRING REEL

A new type reel is announced by the Nordendale Mfg. Co., Chicago. It is described as comprising a self-winding reel equipped with blasting cable which may be unwound to any point within the 125-ft. length of cable, automatically locking itself when that point is reached and remaining so until released by a thumb control operated by the hand holding the reel. Unwinding the cable winds the reel mechanism, which automatically rewinds the cable after the blast.

A safety contact arrangement, equipped with a shunting device preventing any stray currents or sparks from making accidental contact, is located on one side of

the reel. Firing contact is made by pushing blasting unit onto the contact points, which releases the shunting device, making an instantaneous positive contact. Any single shot-blasting unit can be used to provide the necessary current. A swinging guard covers the contact until ready for firing.

TUBING COUPLING

A new coupling for use in flexible ventilation tubing, designed for readily joining sections so as to furnish a substantially airtight coupling that can be readily disconnected when desired, has been devised by the American Brattice Cloth Corporation, Warsaw, Ind. The new



unit consists of a grooved metal band with a turned-up edge at either side, which prevents the solid ring (over which the tubing is folded) from slipping out of position. The band is split at the top to allow expansion for insertion of the rings.

The band is so made that when closed it forms a perfect circle; the tubing is inserted by folding back the end like a cuff and inserting the ring, then fitting it into the opened split band. The lock arm fastener brings the band together so that it fits snugly against the tubing. The lock arm fastener on the band is made adjustable to insure further freedom from air leakage on different grades of tubing material. The coupling unit is connected and disconnected with ease by unskilled labor and contains no threads or bolts.

HOME STOKER

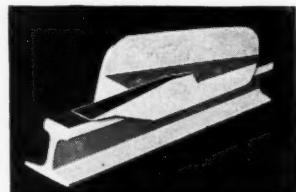
The Stoker Division of Link-Belt Co., Chicago, offers the Challenger, a new stoker for home use, designed to reach an income bracket lower than those which constitute the market for the larger models. It does not replace any other Link-Belt model but supplements the line. Its lower price is made possible by smaller coal-feeding capacity (25 lb. per hour) and manufacturing savings on a new mass-production set-up. The hopper capacity is the same (30 lb.)



as the regular stoker. Such features as the automatic air-meter, load-signal (no shear pin) motor protection, baked-on finish in two tones, heavy hopper construction, etc., are included.

MINE-CAR DERAIL

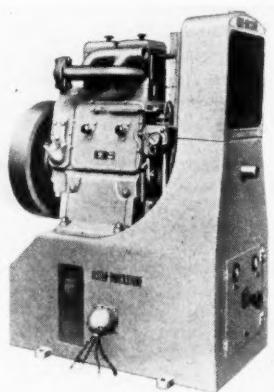
A new mine-car derail designed for increased safety against runaway cars has been introduced by the Portable Lamp & Equipment Co., Pittsburgh, Pa. Constructed to work like a switch, the device is fitted with a flange which guides the car wheel gradually, rather than suddenly, off the track. No tools are required for installing or removing it, and digging under the rail is unnecessary.



The device is simply placed on the rail and tightened by means of a roller binding on the rail head. It can be loosened and removed by kicking or driving it in the opposite direction.

DIESEL POWER UNIT

"Power-Pakt," a new line of diesel-electric power plants, ranging in size from 3,600 to 24,000 watts and built to what is said to be a simple yet revolutionary space-saving design, has been introduced by Lister-Blackstone, Inc., Milwaukee, Wis. The new plants consist of a radiator



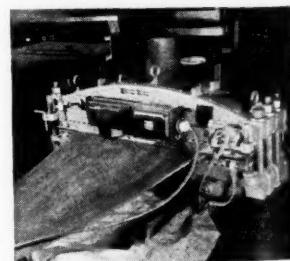
cooled engine, generator and control panel, all assembled in compact form ready to set in place and put to work. The chief change from conventional design is in the placement of the generator directly underneath the engine, thus cutting down floor-space requirements.

RESPIRATOR

H. S. Cover, South Bend, Ind., announces the new "Skin-A-Cat" respirator No. 40. Approved by the U. S. Bureau of Mines for Type A, pneumoconiosis- or silicosis-producing dusts, it is said to be of unbreakable construction with no metal parts, requires no filter plates and filters are held in place by patented adjustable tubular connections. Uncollapsible, unchockable filters are obtained by sewing together according to standard practice and then turning inside out before attaching to face piece. Other features are: two check valves and exhalation valve; over 40 sq.in. of breathing area; light weight (less than 5 oz.); and face-cloth protection against dermatitis with maximum comfort.

BELT VULCANIZER

B. F. Goodrich & Co., Akron, Ohio, announces an addition to its line of belt vulcanizers designated as the 36-42. Made for Goodrich by the James C. Heintz Co., the new vulcanizer has a platen 12 in. wide and long enough to span a 36-in. belt when the vulcanizer is clamped on the belt at approximately a 22½-deg. angle with reference to a line drawn at right angles to the edge of the belt. It also may be used on a 42-in. belt, but must be placed at about 12 deg. from a line drawn at right angles to the edge.



Over-all width is 54 in.; length, 18 in.; height, 23 in.; total weight, 1,145 lb.; total wattage, 4,000; total amperage at 110 volts is 36.4; at 220 volts, 18.2. The electric heating load is 4 kw. during the heating-up period. Equipped with positive thermostats, the proper vulcanizing temperature of 287 deg. F. is automatically maintained.